OFFICIAL PUBLICATION OF THE PROCEEDINGS AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

JUNE 11, 1951
VOLUME 40, No. 12

AMERICAN DYESTUFF REPORTER

DEVOTED TO TEXTILE CHEMISTRY • BLEACHING • DYEING • PRINTING • FINISHING

June 22

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Color that leads a fast life...

Always dye with an eye to the end use

Du Pont Dyestuffs

DU PONT

REG. U. S. PAT. OFF.

DU PONT VAT DYES give you colors that are fast for the life of the garment. On children's playclothes, for example, vat colors stay crisp and new-looking during the endless trips through the washtub.

You can choose the shades you want from a rainbow's range of brilliant, uniform, deep-penetrating colors—in Du Pont PONSOL* and LEUCOSOL* (anthraquinone-type dyes) and SULFANTHRENE* (indigoid and related dyes). Our Technical Staff will be happy to help you find the right dye—and the right method of application—to assure you and your customers lasting satisfaction. E. I. du Pont de Nemours & Co. (Inc.), Dyestuffs Division, Wilmington 98, Del.

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and Beta Oxy Naphthoic Acid (B.O.N.A.)

For eye-catching reds possessing superior fastness properties, *naphthols have no equals.* The quality of Pfister naphthols have occasionally been equaled—but never surpassed. For *best* results—*standardize with Pfister naphthols.*

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for purer and more brilliant whites

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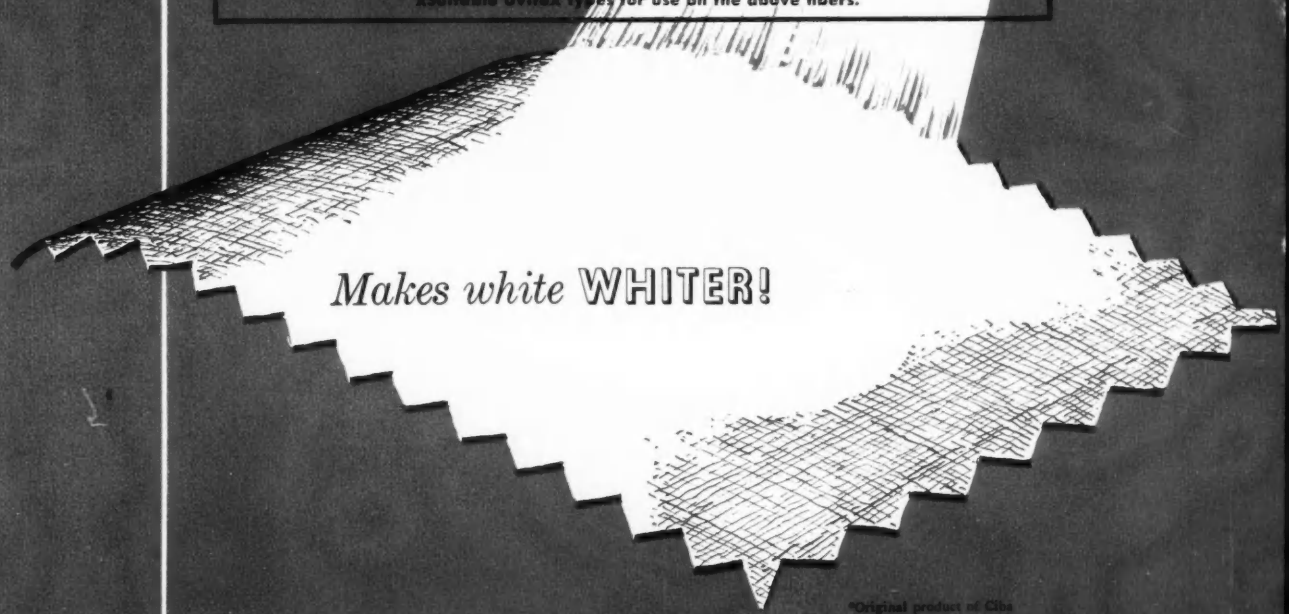
FIBERS	UVITEX RT	UVITEX RBS	UVITEX WS	UVITEX RS
Wool	x	—	x	—
Nylon	x	—	x	—
Silk	x	—	x	—
Acetate Rayon	—	—	x	—
Viscose Rayon	x	x	—	x
Cotton	x	x	—	x
Linen and Hemp	x	x	—	x
Vicara	—	—	x	—
Paper	x	x	—	x

xSuitable Uvitex types for use on the above fibers.



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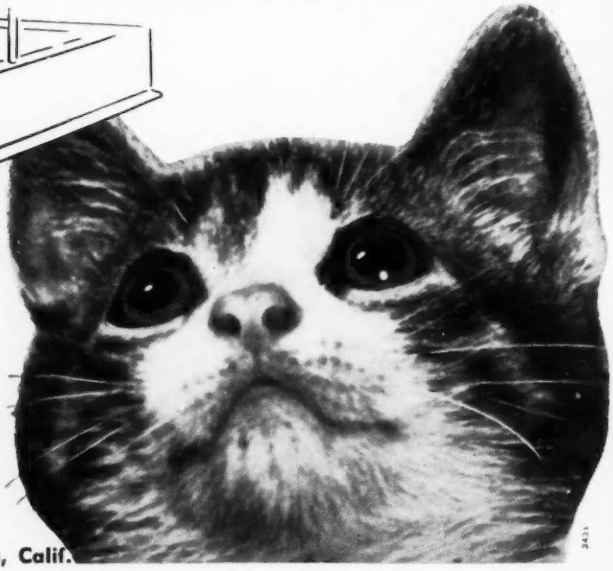
If you have a specific problem our technical service department would welcome the opportunity of submitting samples . . . custom-formulated to meet your individual problem.



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Chemicals PASSAIC, N. J.

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An A.A.P. specialty which *minimizes crocking* and *brightens* Napthol shades by effectively removing free color lake formations. It also *stabilizes* and *prevents decomposition* of Fast Color Base or Salt solutions or print pastes.

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Want to make better goods . . . faster . . . cheaper? You can do it with Wyandotte "high-light" Kreelon*. That is, *if* you use Kreelon creatively. Here's what we mean. Kreelon is highly soluble in water . . . more *totally* soluble than any other detergent of this type we've tested. That means Kreelon is easier-rinsing. Creative suggestion: experiment with the time period allotted to rinsing, the amount of water you use, and its temperature. Chances are you'll save money on water and fuel.

Here are some facts on "high-light" Kreelon for your creative use: Kreelon is stable in acid, alkaline or neutral solutions. (Suggestion: you need not scour in an alkaline media.) Kreelon works more quickly than soap in most operations and at lower temperatures. (Suggestion: you can reduce processing time in scouring, dyeing and acetate saponification.)

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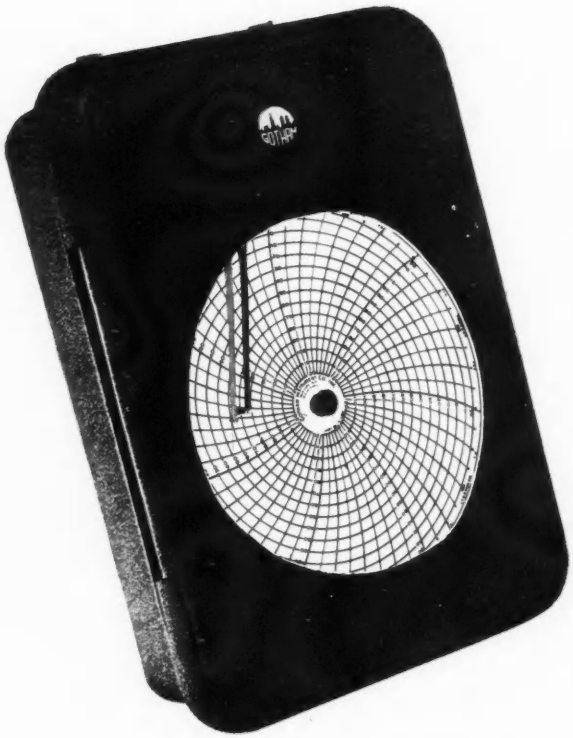
grows or changes to fit your needs



Want an instrument that can grow or change to fit your needs—an instrument that is a miser for maintenance and replacement inventory?—Then choose the Gotham Convertible. It is a 1-2-3-4 pen recorder; 14 pressure, temperature and time operation combinations. It is a recorder controller; there are 38 pressure, temperature and time operation combinations.

All components are Gotham standard, factory calibrated systems, completely interchangeable and easily removable or replaceable at the job site.

Number of functions possible depends on whether instrument is 6", 9" or 12" chart size.

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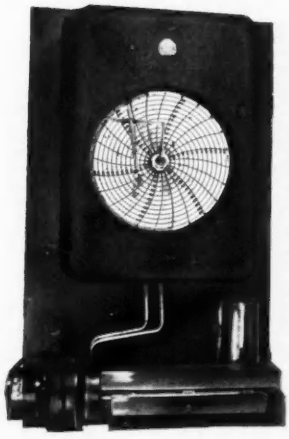

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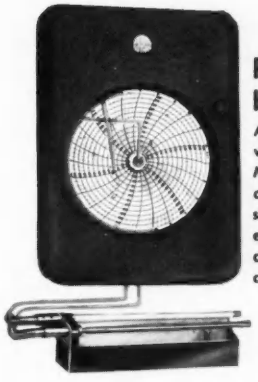

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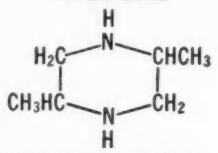

Melting Point: 115.5°C.
Pharmaceutical Intermediate

N-HYDROXYETHYL DIETHYLENE TRIAMINE

$H_2NC_2H_4NHC_2H_4NHC_2H_4OH$

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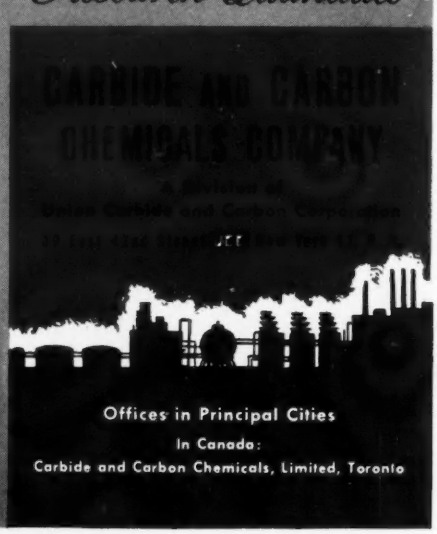
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new, magic finishing formula

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gives dullest tone with most remarkable "hand"

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Santomerse No. 1 is an alkyl aryl sulfonate, with a minimum of 40% active ingredient. Santomerse No. 1 is a rapid wetter and penetrant and a highly efficient detergent.

Santomerse No. 1 rinses out quickly and thoroughly. It is efficient in hard or soft water, in hot or cold solutions, in acid or alkaline baths.

For information on the use of Santomerse No. 1 in hosiery mills . . . or in any textile business . . . contact the nearest Monsanto Sales Office or write MONSANTO CHEMICAL COMPANY, Phosphate Division, 1700 So. Second St., St. Louis 4, Mo.

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Now you can print brighter, sharper, clearer colors on silk, cotton, rayon and linen with vat soluble ester printing pastes . . . if you use Pfizer Ammonium Gluconate as the acid-forming catalyst.

This stable, non-toxic, non-corrosive salt reacts upon steaming to yield an efficient, non-volatile medium. Brilliant prints result from the ability of Ammonium Gluconate to:

1. **make more stable pastes.**
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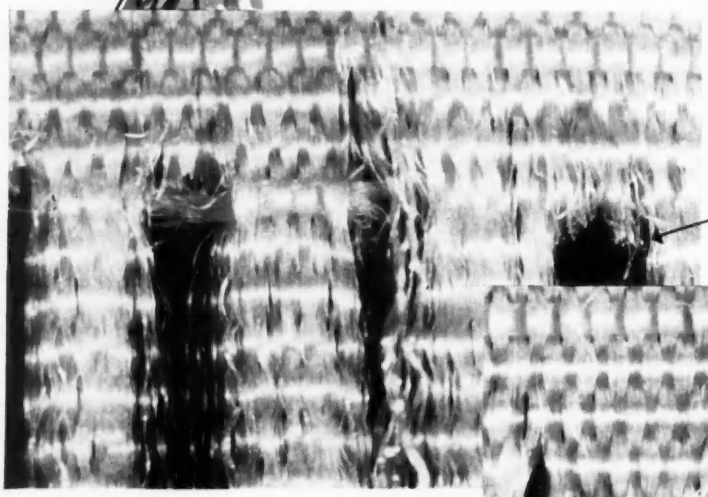
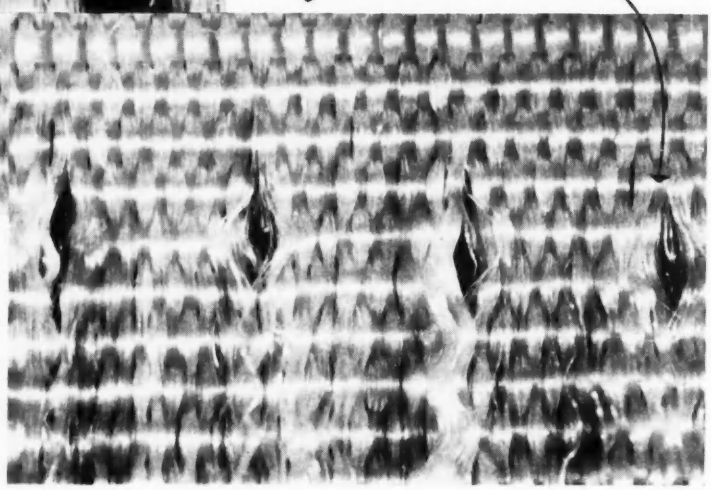
WEAK AT THE SEAMS... UNTIL FIBERS WERE LUBRICATED WITH PROFINE

What causes a well constructed fabric, sewed on modern machines, to exhibit excessive weakness at the seams? The pictures below tell the story.



Picture No. 1 shows the seam of a suiting fabric produced by a well known manufacturer. Needle damage . . . cut threads . . . can be observed where the fabric threads have been unraveled.

Seam threads pulled out here



Picture No. 2 shows a sample of the same suiting fabric . . . pre-treated *with Profine* and sewed under identical conditions. Needle damage is absent . . . no cut threads here!

Profine controls softness, body and hand. If your knitted or woven fabrics require a full-bodied hand, you can get it with Profine. This efficient finishing agent gives you good whites that won't discolor . . . provides good anti-curl cutting . . . permits high speed sewing.

Profine is designed to up-grade fabrics . . . to increase their saleability. Try it.

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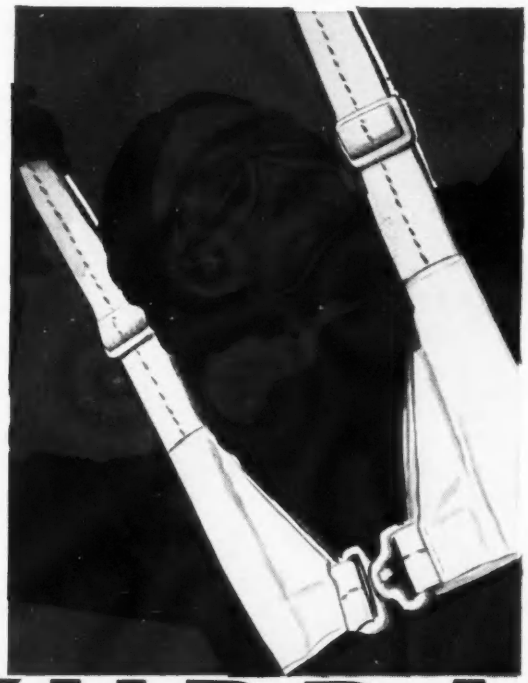
for positive **mildew-proofing . . .**



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WARWICK'S COPPER-8-QUINOLINOLATE *(SOLUBILIZED)*

For all types of webbing . . . parachute harness, cartridge belts, safety belts, etc. . . . KUPRATE OS 10 WR, *with water repellency included,* is unexcelled. Finishers favor this new Warwick formula because it comes as a viscuous liquid—so much easier to handle.

Full details, plus samples and technical counsel are yours for the asking.

Other Warwick mildew-proofing agents:

- **KUPRATE OS 10 WR SPECIAL** . . . for tenting, duck, etc., where specifications require good spray rating and hydrostatic test.
- **KUPRATE OSC-10** . . . for rope and cordage primarily. Low in volatile constituents, it provides a product practically free from fire hazard.
- **KUPRATE OS 10** . . . for thread and for piece goods generally where water repellency is unnecessary or undesirable.

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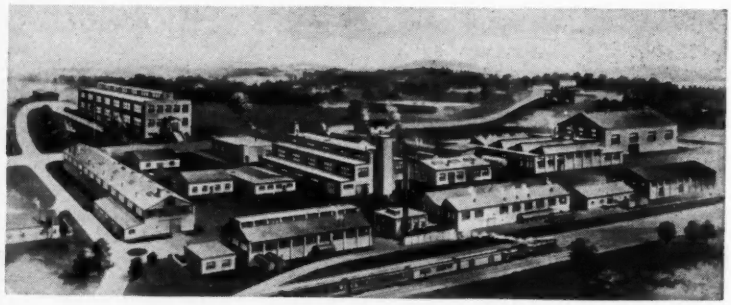

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EASY TO USE: "Avitone" is stable to hard water . . . doesn't turn rancid or discolor on aging. And its wetting action aids shrinking processes.

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Fiber Softener

DU PONT
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Caustic Soda • *Bicarbonate of Soda* • *Ammonia*
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Because They've Been Tested for Toxicity!!

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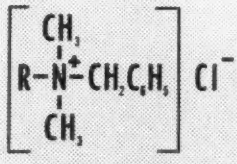
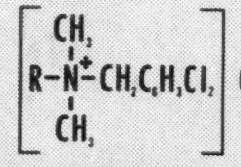
We undertook specific, time-consuming and costly tests to prove, beyond any doubt, that Onyx Quaternaries could be used with complete confidence in their harmlessness. These tests and the conclusions drawn from them are outlined briefly below.

When you use any one of these Onyx Quats, you can not only be sure that they are safe, but that their uniformity and keeping qualities insure effective sanitization at every recommended dilution.



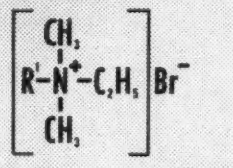
BTC*

The most widely used cationic bactericide and deodorant. Sold in 50% aqueous solution to disinfectant and germicide manufacturers for dilution and/or incorporation in their own products.



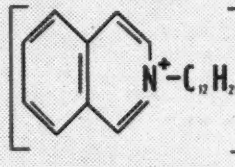
TETROSAN

In extensive use as a disinfecting, deodorizing and preventive antiseptic in veterinary and livestock medicines. Used also in pharmaceuticals for topical applications. Sold in 60% aqueous solution. A mixture of alkyl dimethyl 3,4 dichlorobenzyl ammonium chloride and alkenyl dimethyl ethyl ammonium bromide.



ONYXIDE*

The most effective algaecide now available. In wide use in swimming pools, cooling water, air conditioning systems, etc. Sold as a 75% concentrate in isopropanol or propylene glycol.



ISOTHAN Q15*

An excellent fungicide. Widely used in the formulation of compounds for use in the control of athlete's foot and dandruff. Sold in 20% aqueous solution.

*Trade Mark Reg. U.S. Pat. Off.

Test Data

These four Onyx Quaternaries have been exhaustively investigated by an independent biological laboratory to determine these questions of toxicity and irritation. Their findings have shown conclusively that all four are non-toxic, non-irritating and non-sensitizing in all use-dilutions of 1-1000 or weaker, and that there is no danger of cumulative toxic action due to chronic ingestion of any residues left on food equipment due to inadequate rinsing. These findings are the result of . . .

(1) Acute and sub-acute toxicity on guinea pigs, white rats and dogs.

(2) Chronic toxicity tests based on daily ingestion of sub-lethal, but moderately heavy dosages, carried out on guinea pigs for one year, and on white rats for two years.

(3) Skin irritation and sensitization tests made on 200 humans.

We welcome your comments on these questions of sensitization and toxicity, and shall be glad to cooperate with you in answering any misconceptions you may run into.

If you are interested in any one of these particular "quats," please ask for data. Onyx BTC is covered in a very thorough technical handbook which also outlines the major characteristics of the quaternaries.

onyx

ONYX OIL & CHEMICAL COMPANY
TEXTILE DIVISION
190 WARREN ST., JERSEY CITY 2, N. J.
CHICAGO · BOSTON · CHARLOTTE · ATLANTA

In Canada Onyx Oil & Chemical Co., Ltd., Montreal, Toronto, St Johns, Que *For Export Onyx International Jersey City 2 N. J.*

"Whether there be Prophecies, They Shall Fail"

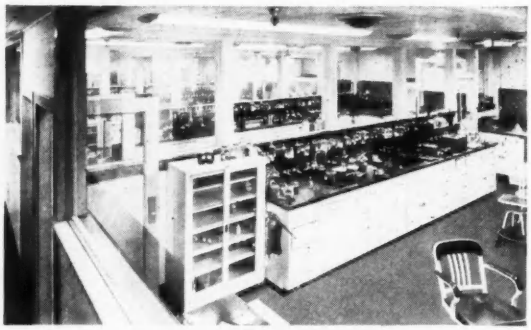
. . . those words, spoken by a redoubtable seer nearly 2000 years ago, have probably never been so pertinent as they are today. For today's most carefully computed prediction may prove completely false tomorrow. *We* certainly are not attempting to prophesy anything, but are simply keeping "our noses to the grindstone" doing all we can to provide the textile industry with top quality chemicals that assure better and more economical processing, and *superior products.*

The pictures shown here join with our headline to emphasize this message we would leave with you: *Whatever the uncertainties ahead, you can do no better than call upon the experience, skills and facilities accumulated by Nopco*.*

One of the oldest and most reputable suppliers of processing chemicals, we are prepared to supply you with outstanding Nopco FUA, an extremely versatile and efficient wool oil; Nopco 1656-R, the *one* worsted lubricant that eliminates static; nylon coning oils, dyeing penetrants; synthetic detergents and wetting agents; silk and rayon throwing oils; and the many other textile products for which we are famous.

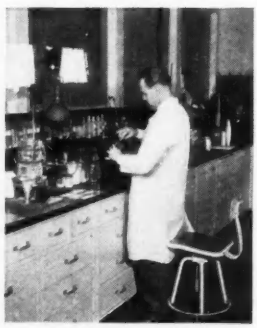
As you go to work today in the interests of national defense, remember, too, that we are ready to make recommendations and supplement laboratory data with technical aid right in your mill. It will remain our fixed policy to serve you to the best of our ability, *come what may.*

Nopco Headquarters — Harrison, New Jersey



New Nopco Research Laboratories

Evaluating the effectiveness af warp and filling size formulated to give specific weavina results.



Preparing a sample of processing oil preparatory to running exacting laboratory tests.

NOPCO
EVOLVED THRU RESEARCH

NOPCO CHEMICAL COMPANY
HARRISON, NEW JERSEY
Branches: Boston, Chicago, Cedartown, Ga., Richmond, Calif.

*REG U S PAT OFF

for prints that conceal...

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...or prints that reveal!

Ambertex M — the revolutionary thickener for durable camouflage cloth . . . or sheer summer prints! For Rapidogen, Vat or Acetate colors . . . and white discharge, too. For screen or machine printing . . . Versatility along with spectacular savings in time and labor!

Ambertex M is a ready-to-use concentrated printing gum. Pre-controlled for viscosity and stability. Preparation time: just a few minutes. It deposits a soft pliable film that minimizes splitting of the sheerest fabrics. Deep penetration insures full discharge of the ground color. Razor-sharp detail. And once the job is done, Ambertex M rinses out quickly and easily!

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National STARCH PRODUCTS

HOOKER CHEMICALS

basic for: **SYNTHETIC FIBERS**
TEXTILE PROCESSING
DYESTUFF MANUFACTURE

Directly or indirectly, the textile industry depends upon Hooker for uniform high quality chemicals.

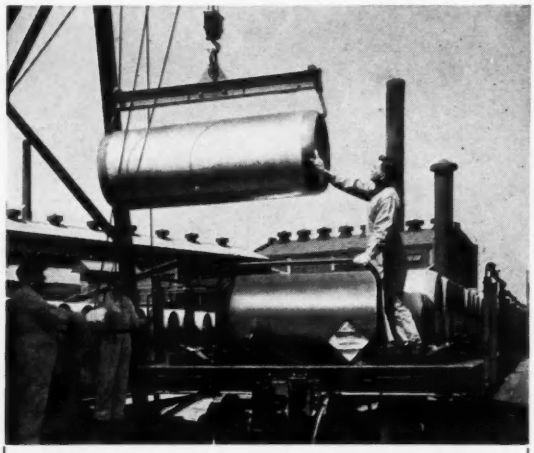
Viscose Rayon, for example, employs Hooker Chemicals all the way from the manufacture of dissolving pulp (chlorine and caustic soda) to the final production of fibers (caustic soda, lauryl pyridinium chloride, sodium sulfide, sodium sulfhydrate).

Textile Processing uses Hooker Caustic Soda for kier boiling, mercerizing, in sodium hypochlorite bleach, and as a dyebath assistant. Hooker Chlorinated Paraffin is used in formulations that make canvas water-repellent and fire-retardant.

Dyestuffs . . . Although we do not manufacture dyes, we provide over 30 dyestuff intermediates that go into the making of the finished textile product. The most important of these are listed at the right.

Special Products . . . We are interested in working with dyestuff and specialty manufacturers to develop new intermediates for use in dyes, mothproofing compounds, flame retardants, and similar products. In addition to the products we regularly supply, we have provided many new and special chemicals, on pilot plant or commercial scale. Your inquiry is invited.

FOR UP-TO-DATE DELIVERY INFORMATION . . . please keep in touch with your Hooker sales representative. He will keep you informed of any changes in the delivery situation, and will notify you promptly as materials become available.



LIQUID CHLORINE in one-ton containers—one of several convenient packages in which Hooker ships this high-purity bleaching agent.

For Rayon Manufacture and Processing

Caustic Soda	Lauryl Pyridinium Chloride
Sodium Sulfhydrate	Sodium Sulfide

For Textile Processing

Benzoic Acid	Muriatic Acid
Caustic Soda	Sodium Sulfhydrate
Chlorine	Sodium Sulfide
Chlorinated Paraffin	

For Dyestuff Manufacture

Aluminum Chloride	Monochloroacetic Acid
Benzoyl Chloride	m-Nitrobenzoyl Chloride
Benzyl Chloride	p-Nitrobenzoyl Chloride
Caustic Soda	Phenyl Isocyanate
Chlorine	Sodium Sulfhydrate
Chlorobenzenes	Sodium Sulfide

• • •

For the complete list of Hooker Chemicals, send for Bulletin 100. For properties, specifications and typical uses of any chemicals listed here, ask for Technical Data Sheets. Please request them on your business letterhead.

From the Salt of the Earth

HOOKER ELECTROCHEMICAL COMPANY

2 FORTY-SEVENTH ST., NIAGARA FALLS, N. Y.

New York, New York • Wilmington, California • Tacoma, Washington

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HLORIDE

11, 1951

NEW FIBERS—NEW TECHNIQUES—NEW PROBLEMS

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If your problem is dyeing

ACETATE RAYON CHEMSTRAND
NYLON DYNEL ORLON DACRON
CELCOS VISCOSE · VICARA GLASS

we offer practical assistance based upon the accumulated experience of our Research Laboratories and Field Technicians.

We will recommend the dyestuffs to use and suggest the method of dyeing which in our experience gives the best result in terms of end-use. Submit your problem to our nearest sales office. Your inquiry will receive careful and prompt attention.

GENERAL DYESTUFF CORPORATION

AHCO PRODUCTS

Flower Petal SOFTNESS For Your Fabrics

THAT'S DURABLE!

That *natural* softness so desirable in fabrics is yours when you use AHCOVELS. AHCOVELS give fabrics a finer finish, smoother, flexible hand and softer drape!

Here are AHCOVEL performance features:

- ✓ Lasting resistance to usual laundering and dry cleaning.
- ✓ Good stability to heat and storage.
- ✓ Odorless.
- ✓ AHCOVELS E. — F. and R. assure full retention of light fastness of any color.

AHCOVELS A. and G. are cationic substantive softeners.

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Ask about AHCOVELS for cotton, wool and synthetic fibers.

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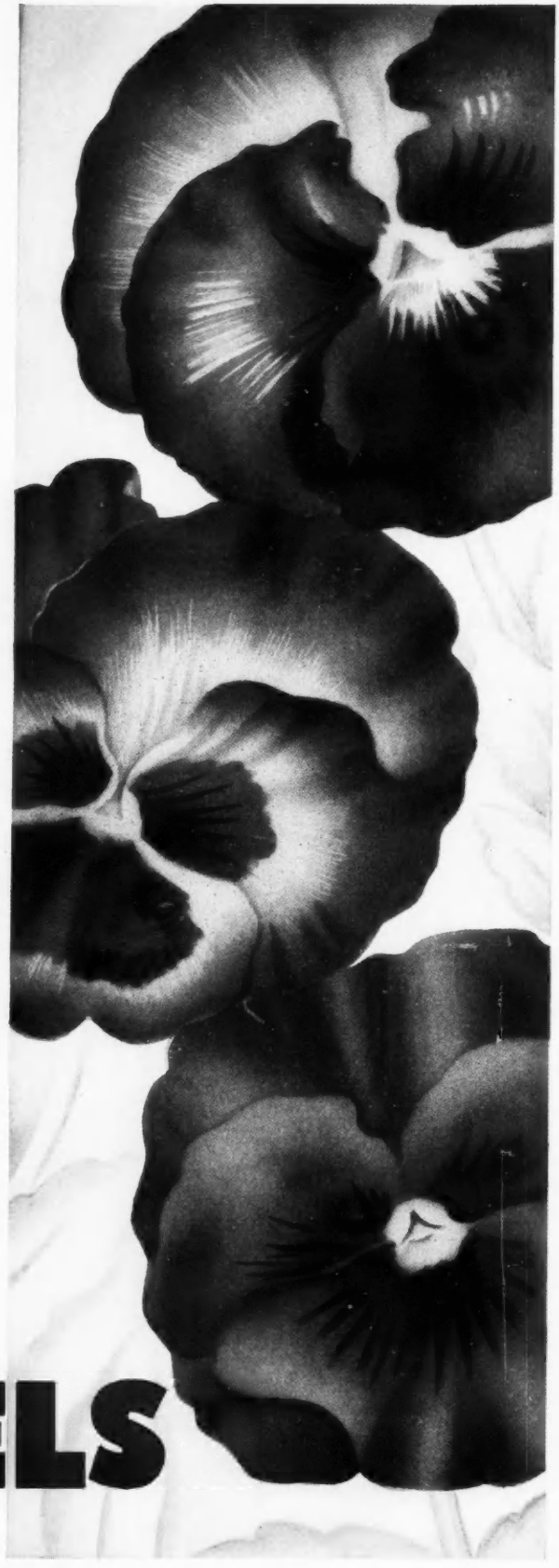

AHCOVELS

SURE AS HOOTING...

TRITON X-100

speeds your processing from gray to finish

Makes water wetter —so it penetrates better

TRITON X-100 is a concentrated 100% active penetrant and detergent, non-ionic, and alkali-and-acid stable. As a scouring agent for wool, cotton and synthetic fibres, it is a fast wetter, an excellent detergent and an outstanding emulsifier for oil and grease. And in dyeing and finishing too, it speeds processing and cuts costs. Be wise and thrifty. Send for full details of TRITON X-100 today.

CHEMICALS FOR INDUSTRY

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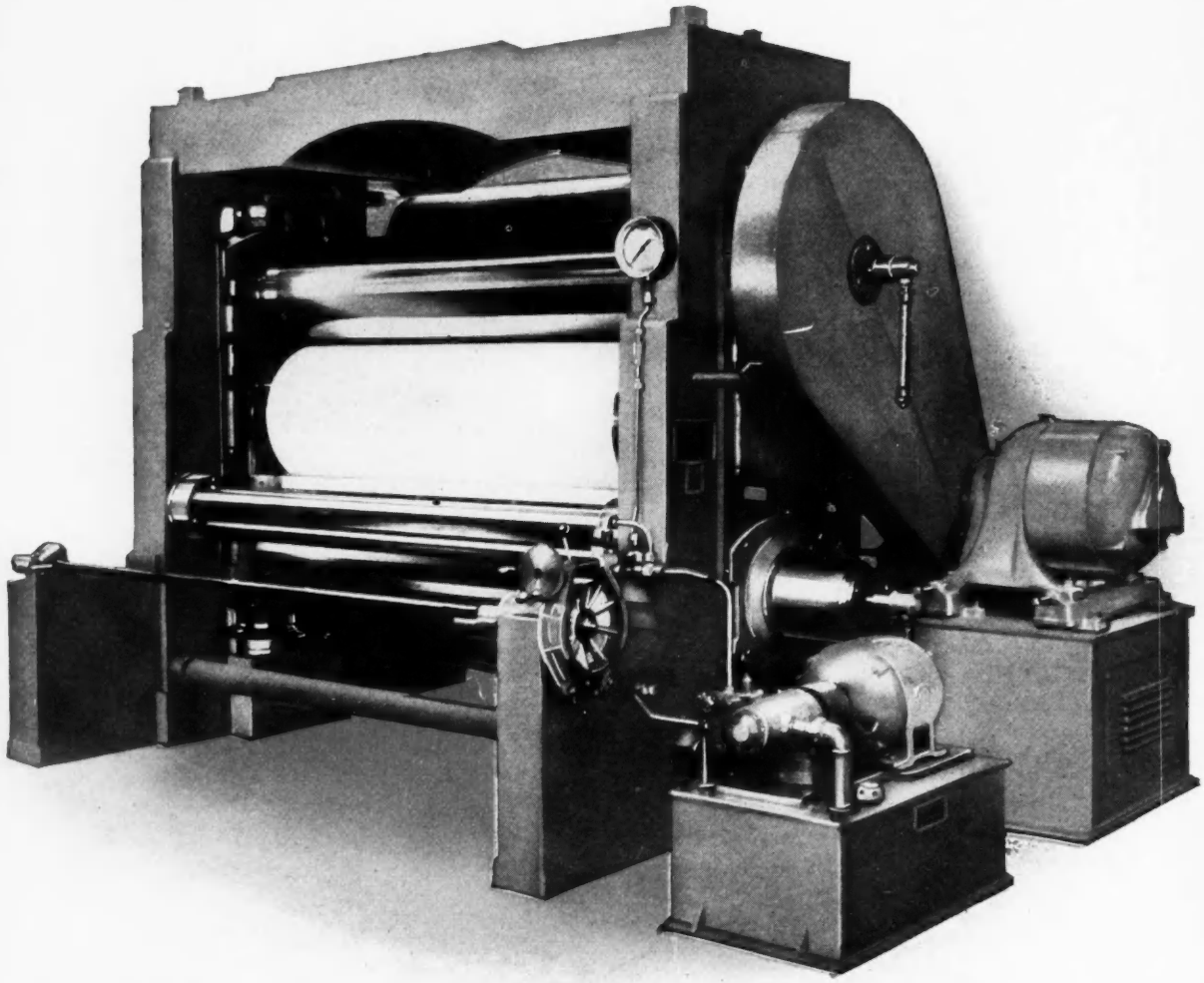
Representatives in principal foreign countries

TRITON is a trade-mark, Reg. U. S. Pat. Off. and in principal foreign countries.



RUGGED DEPENDABILITY

Nowhere does massive sturdiness pay off in satisfaction more than in a heavy-duty calender. The V.V. 80 Ton Hydraulic Calender is well known to the trade for its rugged dependability. Here's why:

In design, workmanship and materials nothing has been overlooked. Heavy cast, box section frames are connected to cast iron and steel cross girts with close fitting, machined faces. Bearing guide slides for calender roll are machined for correct working surface.

Top and bottom rolls are chilled iron 16″ and 20″ in diameter—turned, ground and polished. Both are bored with chambers for steam heating. Intermediate roll, 22″ in diameter, is of selected, seasoned and bonded cotton, pressed on hammer-forged steel shaft with hammer-forged steel heads.

Bearings are heavy duty, spherical, roller type.

Lubrication is by a circulating oil system, giving a continuous flow from reservoir through bearings to pump and filtering unit, back to reservoir.

New design, using piston rings instead of packing, eliminates down time for repacking. Piston diameter has been enlarged to maintain 80 ton nip pressure with only 770 pounds per square inch oil pressure instead of 2000 pounds as previously required.

Totally enclosed, two stage hydraulic pump is directly connected to motor. Extremely large self-aligning spherical roller bearings mean a great saving of power, enabling a 25 h.p. motor to supply ample power to drive the machine at 75 yards per minute. Standard widths are 65″ and 70″.

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You are invited to see this machine.

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Cable address: VLAANDEREN, Patersonnj, U. S. A.

World's largest manufacturer of machines for processing modern fabrics

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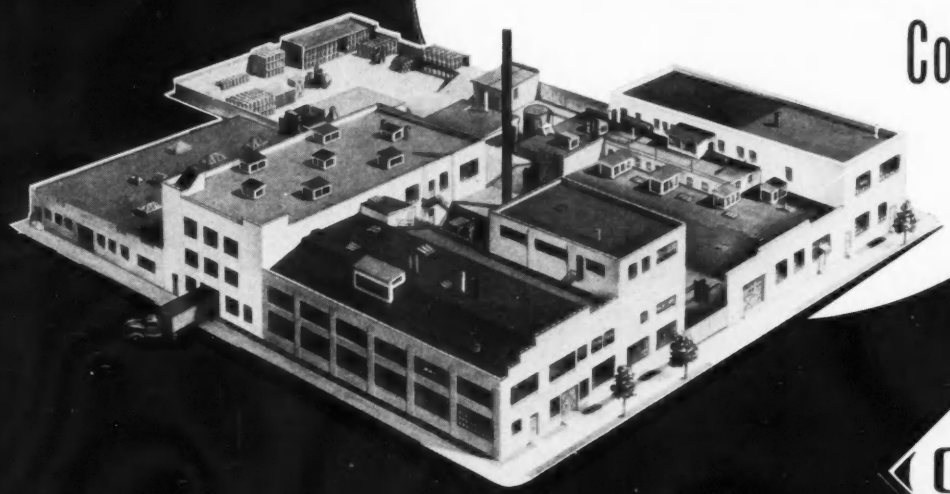

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DYER S. MOSS, Southern Representative

"Proper Processing—a must for fashion-right fabrics!"

This off-the-shoulder cocktail dress by Ceil Chapman features a striking full coat. Made of shantung-weave silk taffeta, it comes in solid pastels and darks.

says

Ceil Chapman

noted American designer

"Inspiration comes easy," says Miss Chapman, "when a fabric lends itself to creative work. PROPER PROCESSING does *so* much for a fabric—actually *inspires* good design by the wealth of life and luxurious texture it brings out."

Top designers from coast to coast agree with Miss Chapman. Reason enough for the choice of Colgate-Palmolive-Peet wetting, scouring, fulling and dispersing agents by so many leading American mills, converters, finishers and dyers.

Whatever your fabric, whatever your processing problem, there is a C. P. P. soap or synthetic detergent perfectly suited to your needs. It will pay you to ask your local Colgate-Palmolive-Peet representative for details . . . or, write today to

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COLGATE FORMULA 25
For low-temperature washing ordinarily requiring olive oil soaps. Sold in eastern states only.

COLGATE WHITE SOAP FLAKES
High-grade thin white flakes. Not milled or polished. 90% anhydrous soap.

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Made from pure tallow, guaranteed to contain 88% or more soap. Titer approx. 42°C.

ARCTIC SYNTEX A AND T
Synthetic detergents and wetting agents. Unsurpassed for many processing operations.

MENTOR BEADS
An alkyl aryl sulfonate detergent . . . of high purity . . . stable in acid and alkali . . . outstanding detergent and wetting properties. Sold in eastern states only.

FREE! *New 1951 Handy Soap Buying Guide . . . Tells you the right soap for every purpose! See your C.P.P. representative, or write to our Industrial Department.*

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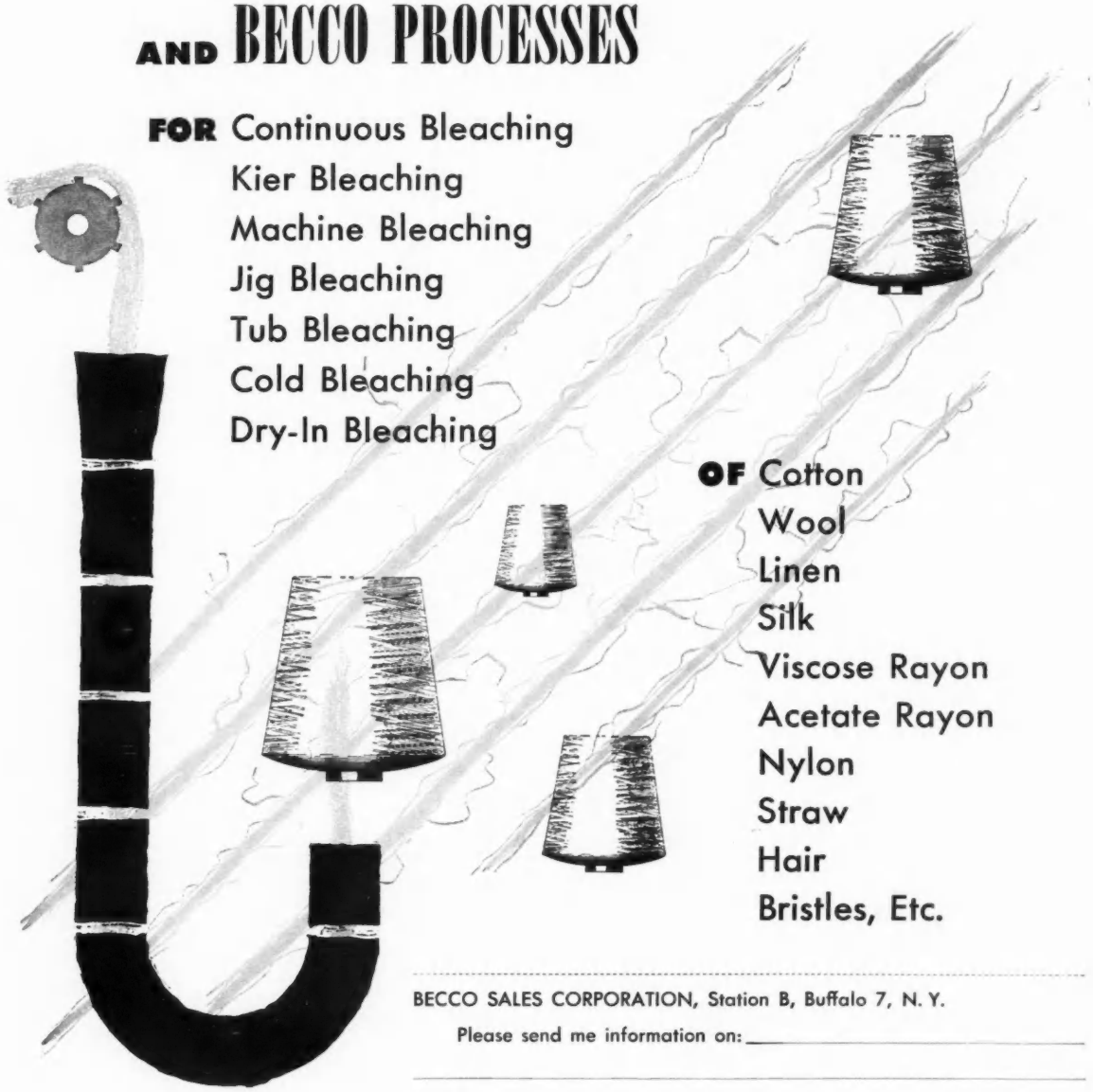

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EASTMAN ACETATE DYESTUFFS

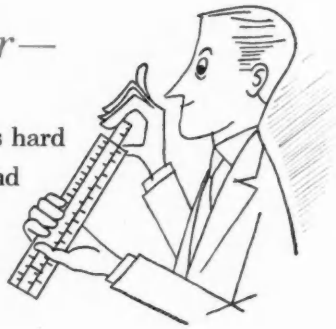
forecast

This is an Eastman research chemist—

busily making today's dyes obsolete. He's never satisfied. As soon as tomorrow's dyes are developed he'll be at work on the day after tomorrow's.

This is an Eastman production engineer—

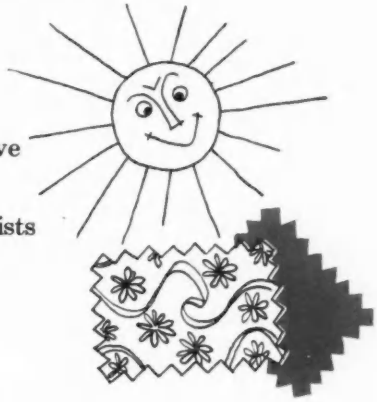
As far as he's concerned today's manufacturing methods are in the horse and buggy era. He's hard at work planning new processing techniques and designing new equipment with which to produce stronger and better dyes at less cost.



Every now and then something really happens,

like back in 1938 when Tennessee Eastman first introduced Eastman Blue BNN. We first charged you over $3.00 per pound for this unique blue—and it was worth every cent of it. Today, however, we are producing a better and stronger Blue BNN and offering it to you for less than half its original price.

Ten years ago a group of our research chemists developed two outstanding fast-to-light yellows, Eastman Fast Yellow 4RLF and Eastman Fast Yellow GLF.

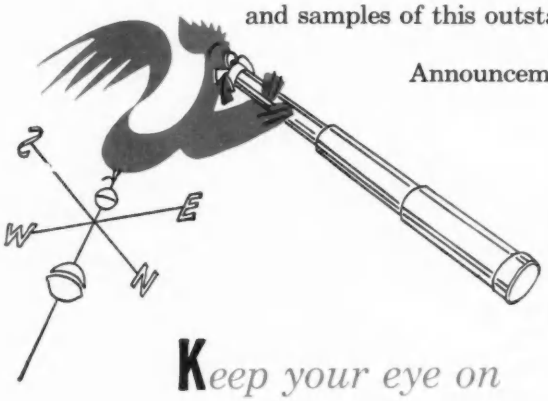


Two years ago, having become quite sensitive to the frequently heard complaint—"Why can't we get a real light-fast acetate red?"—Eastman chemists presented the industry with an answer—Eastone Fast Red GLF.

We now have in the final stages of development, a new family of acetate colors which gives promise of being superior to any similar dyes now on the market. They include a fast-to-light green shade of yellow, a gas-fast red violet, and a new blue with extremely good fastness to both light and gas.

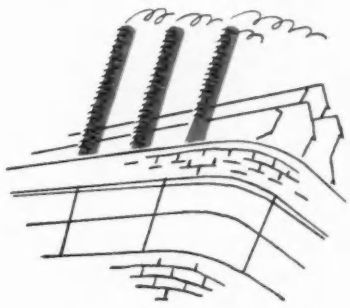
It is the blue which we plan to offer first. Commercial tests are almost completed. We expect to be able to send you complete information and samples of this outstanding blue within a very short time.

Announcements concerning the other new dyes should follow shortly.

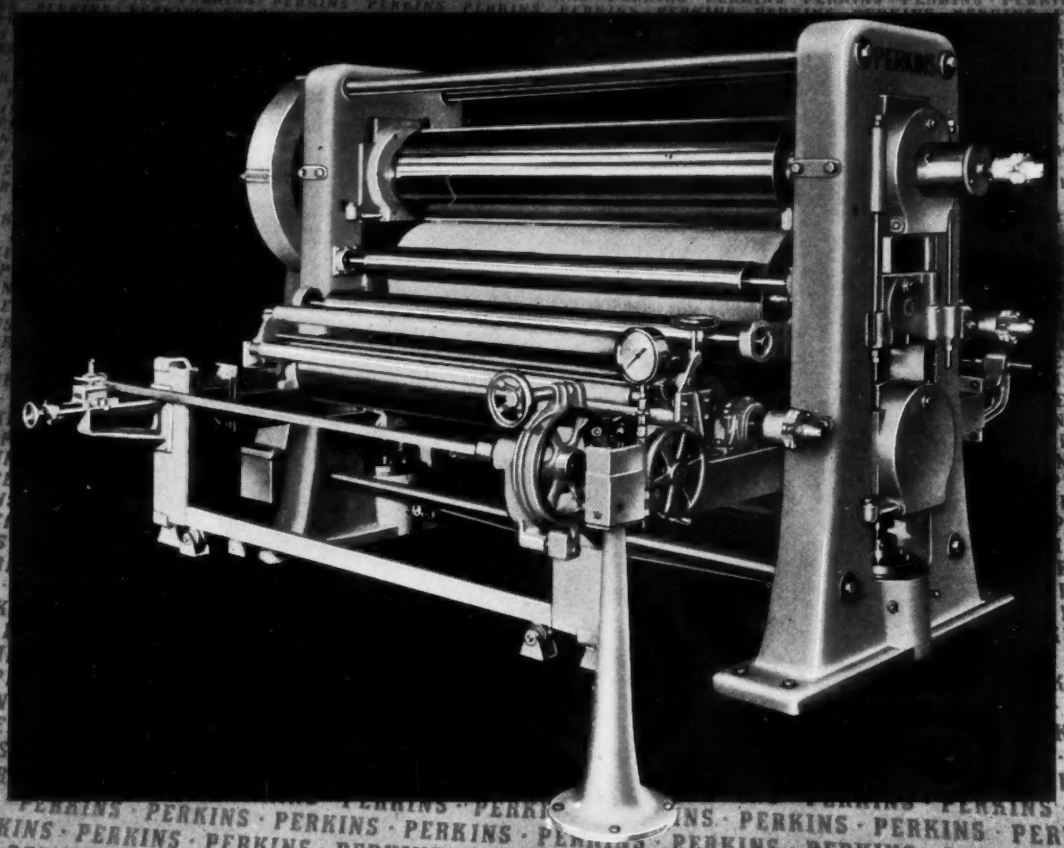


Keep your eye on
Tennessee Eastman

For from Eastman laboratories will come the acetate dyes of tomorrow. Better dyes—faster dyes—at a lower cost.



TENNESSEE EASTMAN COMPANY, *Division of Eastman Kodak Company,* KINGSPORT, TENNESSEE



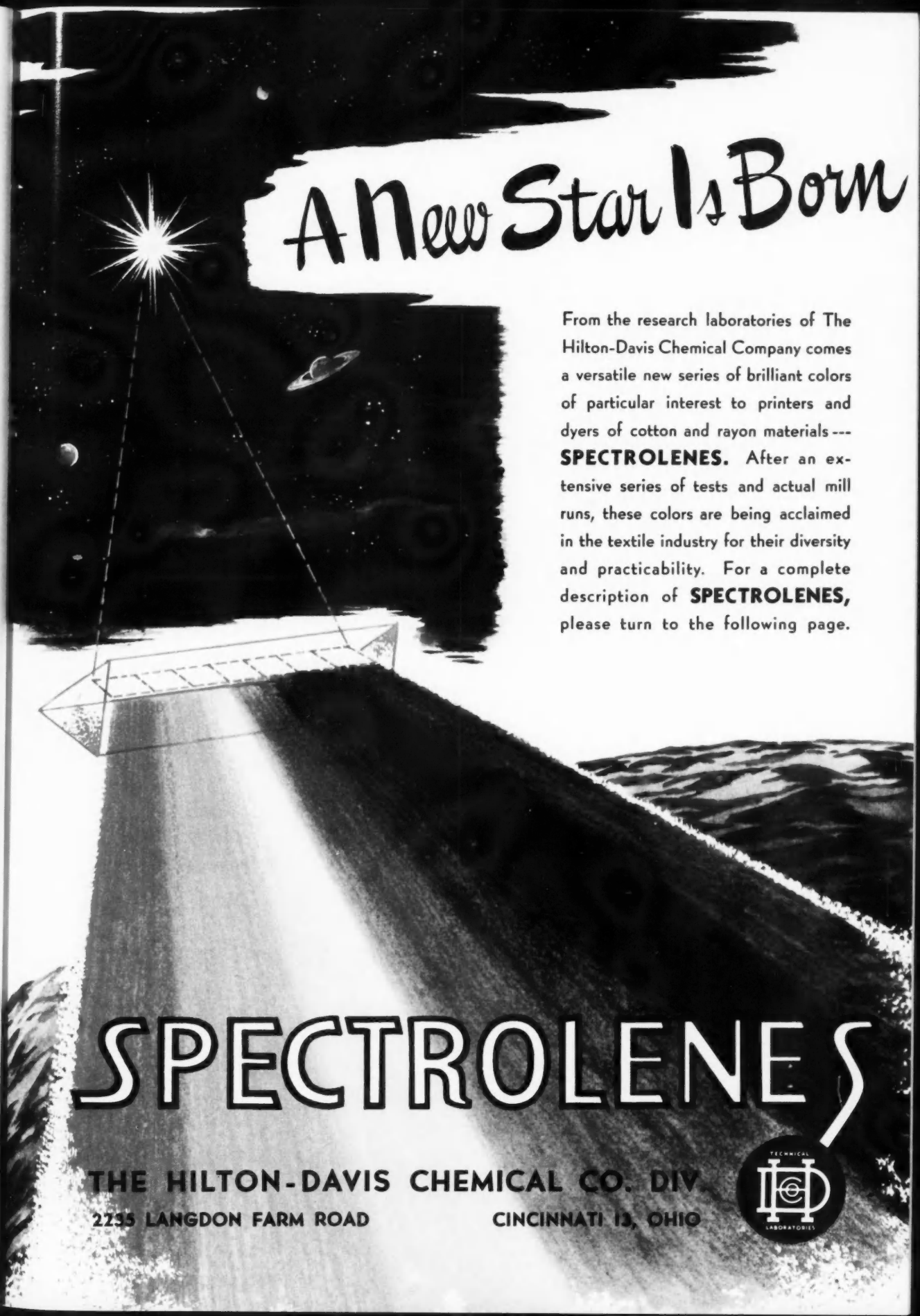
PERKINS POINTS WITH PRIDE

to this new three-roll 83" face 60-ton Hydraulic Rolling Calender. Top and bottom rolls, chilled iron. Intermediate roll, cotton. This calender is equipped with variable speed drive, pre-heating drum, cooling drum, three-bar tension group and a let-off which is adjustable laterally and horizontally.

B. F. PERKINS & SON, Inc.

HOLYOKE, MASS., U.S.A.

LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD


A New Star Is Born
From the research laboratories of The Hilton-Davis Chemical Company comes a versatile new series of brilliant colors of particular interest to printers and dyers of cotton and rayon materials --- **SPECTROLENES.** After an extensive series of tests and actual mill runs, these colors are being acclaimed in the textile industry for their diversity and practicability. For a complete description of **SPECTROLENES,** please turn to the following page.
SPECTROLENES
THE HILTON-DAVIS CHEMICAL CO. DIV.
2235 LANGDON FARM ROAD
CINCINNATI 13, OHIO

What are

SPECTROLENES ?

SPECTROLENES are Hiltonil Fast Color Bases which have been completely diazotized and then stabilized in such a manner as to prohibit coupling with naphthols in solution or naphtholated material until the stabilizer is broken down. The base is released from the stabilizer by the action of acid or acidified steam, such as an acid ager, allowing complete coupling of the naphthol with the fast color base.

Spectrolenes have been thoroughly plant tested and acclaimed for the following features:

Spectrolenes are Versatile: — The number and range of shades possible with any Spectrolene is limited only by the number of naphthols available. Combinations of naphthols greatly increase the range of possible shades.

Spectrolenes are Stable:—Spectrolenes have excellent stability by themselves or when combined with naphthols. As Spectrolenes are mixed with naphthols in the plant where applied, the loss of color value due to prolonged storage is minimized. The freshness of the combination gives added brilliance and color value.

Spectrolenes are Practical:—Spectrolenes are in solution form for ease of handling and are standardized to the best strength for practical plant usage. For the printer, Spectrolenes make available many shades having varying costs and fastness properties, most of which have not been previously available.

Spectrolenes Have Many Possibilities:—Inasmuch as Spectrolenes are a comparatively new development, there are many forms of application which have not yet been fully explored. Wherever naphthols and fast color bases or salts are used, there is a possibility that Spectrolenes may be of value.

Spectrolenes Presently Available:—Spectrolene Red KB, Spectrolene Red RC, Spectrolene Scarlet 2G, Spectrolene Orange HD, Spectrolene Blue B. Other Spectrolenes are in process of development.

For complete technical information or a demonstration of the uses of Spectrolenes, contact:

The Blackman-Uhler Company, Inc.—Spartanburg, South Carolina
The Claflin-Dorman Company—Boston, Massachusetts
The Canadye Corporation—Hamilton, Ontario

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Manufacturers of Dyestuffs for the Textile Industry
CINCINNATI 13, OHIO

Litho in U. S. A.

a NEW detergent and dyeing assistant

(NON IONIC)

REPCOL A-100
(100% active)

REPCOL A-20
(25% active)

UNUSUALLY EFFICIENT and DEFINITELY ECONOMICAL

SAMPLES and FULL PARTICULARS AVAILABLE UPON REQUEST

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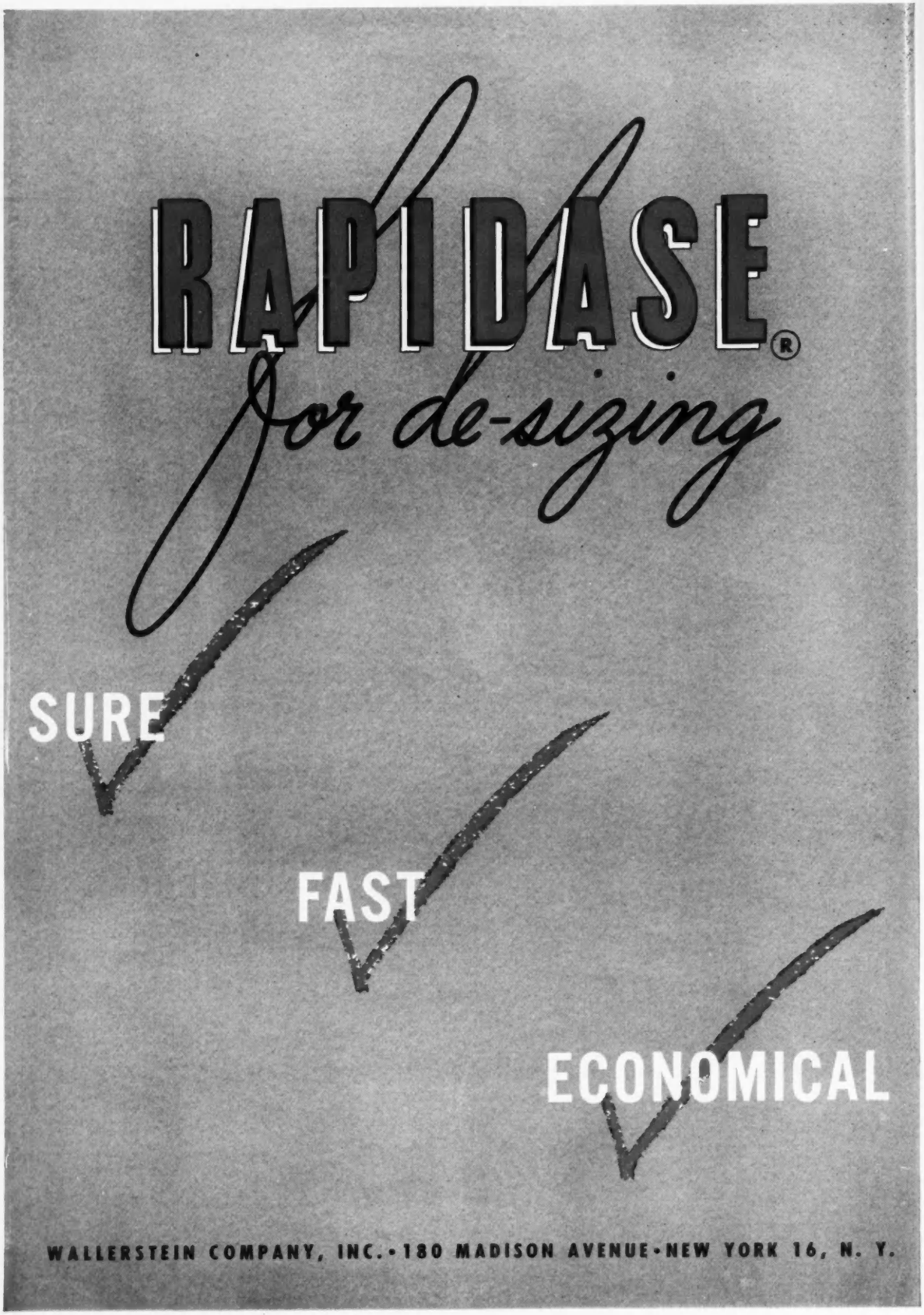
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HOW LIXATE BRINE CUTS DYEING COSTS

MORE UNIFORM DYEING: More and more plant managers are learning how to get better dyeing results, yet cut operating costs, by using Lixate brine. The use of saturated Lixate brine in the dye bath, instead of dry salt, improves the quality of finished goods by helping to eliminate spots, streaks and white edges. When dry salt is added, it tends to create areas of concentrated brine around the grains of salt. These concentrated areas drive excessive quantities of dye into fabrics, causing spots and streaks. Lixate brine helps overcome this difficulty because it disperses instantly and evenly through the bath, producing a smooth exhaustion of the dye.

CUTS SALT CONSUMPTION: Many mills report that they use approximately 12% less salt when Lixate brine is used in the dye bath. This is because saturated brine is more efficient as an exhausting agent. One gallon of saturated brine contains 2.65 pounds of salt. But when used as the exhausting agent, one gallon of saturated brine appears to be equivalent to three pounds of dry salt. This is the figure used for best dyeing results by actual experience.

CUTS OPERATING COSTS: Results at mills that have changed from dry salt to Lixate brine indicate that brine increases plant efficiency and reduces operating costs. The brine method not only helps eliminate redyeing, but also cuts down on unnecessary salt handling because brine is made automatically and piped throughout the plant.

HOW IT WORKS: An engineering development of the International Salt Company, Inc., Scranton, Pennsylvania, the Lixator consists of a rock salt storage hopper over a dissolving tank with a brine collection chamber. Rock salt flows by gravity into the tank at the same rate it is dissolved, automatically replenishing the supply. Water enters near the top. As water flows downward, it dissolves the rock salt, until it becomes fully saturated some distance from the bottom of the tank. From that point on the remaining rock salt acts as a filter bed that removes all insoluble matter from the brine. As a result, when it reaches the collection chamber, the brine is crystal clear and fully saturated. Lixate brine is always crystal clear and neutral — free from acids and alkalies — and for that reason is also used to regenerate zeolite water softeners. The same Lixator provides saturated brine for this purpose and for use in the dye vats. Lixators may be made in any size to meet individual plant requirements.

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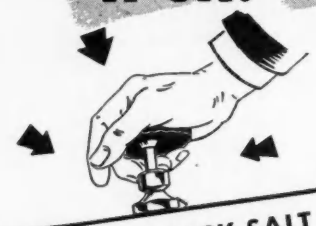

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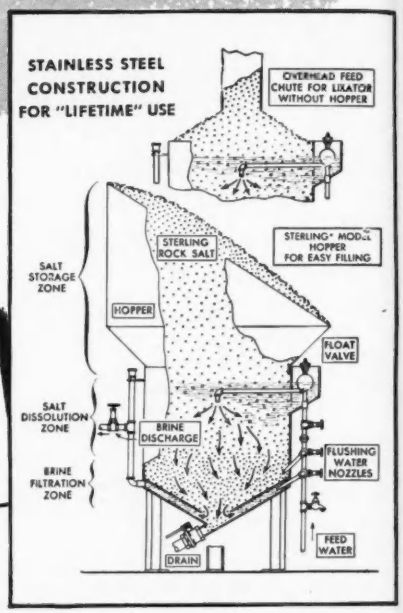

HOW LIXATOR WORKS

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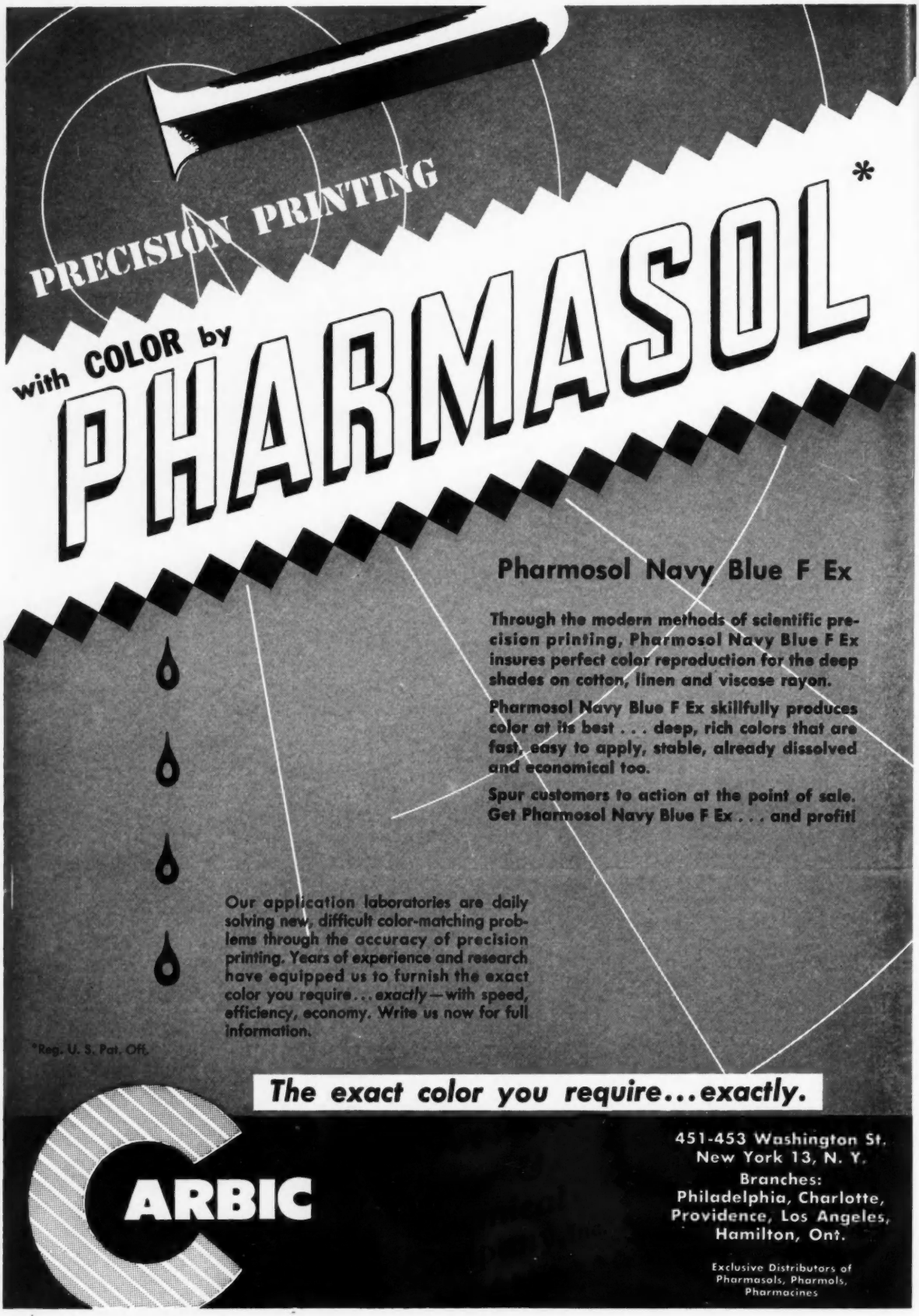
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JUNE 11, 1951
VOLUME 40 NUMBER 12

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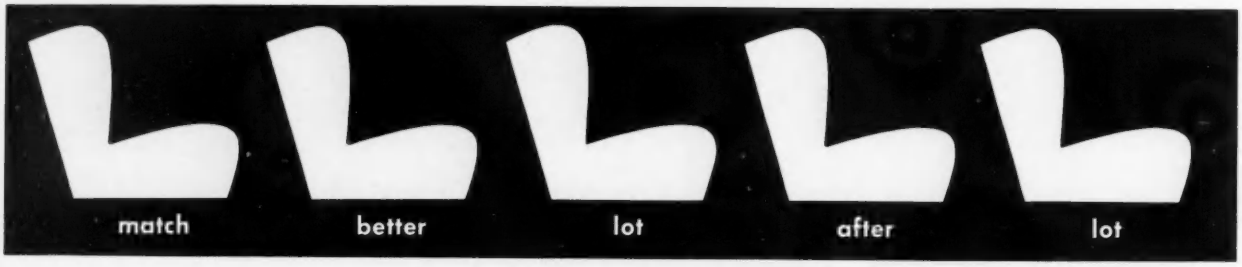

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SIDELIGHTS ON TEXTILE PRINT THICKENERS*

THE aim of the present notes is to show in how many ways thickenings may be used apart from the usual and main object of acting as the thickening medium proper in the application of dyestuffs in textile printing. A further object is to illustrate how various types of thickeners may act as auxiliaries to the main thickening mediums in roller, screen and hand block printing.

Thickenings Used.

(a) Starches—Wheat and Maize.
(b) British Gums, which are made in a wide variety, being the product of various stages of conversion of starches to dextrine.
(c) Natural gums, such as arabic, tragacanth, locust bean gums, etc.
(d) Industrial or crystal gums.

USES OF STARCHES

Starches are used mainly in the usual manner as print thickeners which may be modified in many ways to suit particular usage. The main features of such thickeners are their low solid content, good flow properties and high color yield. Apart from such main uses, another way in which starch thickenings are used in printing is in the form of "paste" or "gum" water. This is an important side line for this type of thickener and finds wide application in many printing processes.

THE PLAIN ROLLER

This piece of equipment in textile printing requires the use of thin starch paste as just described. The objects of this piece of equipment are varied and may be enumerated as follows:—

(a) The production of levelness in blotch printing.
(b) The removal of surplus print paste which might afterwards give rise to trouble in drying, steaming and washing off.
(c) The avoidance of soiling where dark colors are likely to "carry-over" into lighter shades.

In all cases the plain roller is inserted after the colors whose surface surplus has to be removed. Starch paste provides the best medium for this purpose and acts as a lubricant for the plain roller surface which works in conjunction with the lint doctor blade. As the surplus print paste is lifted from the damp printing impression coming into contact with the plain roller surface, the latter revolves against the edge of the lint doctor blade which catches such surplus and conducts it to the side of the machine via a suitably placed trough.

COLD SWELLING STARCHES

These bodies are the result of the use of different polymerizing or hydrolyzing processes, selected and applied before or during the gelatinizing process, with the final production of bodies which swell in aqueous solution, with resultant smooth paste. The idea of gelatinizing by chemical means is to open the starch cells which thus are made to react speedily in the presence of water.

The chemical treatment of starches, with this end in view, involves the use of enzymes, acids, alkalis and oxidizing agents, for example, sodium carbonate, oxalic acid, malt extract, per-sulfates, permanganates, etc. The resultant cold swelling starches thus obtained may be applied usefully as auxiliary bodies to the main thickening agents of starchy origin, though this does not preclude their use also as main thickening bodies.

One such auxiliary use is that of the restoration of body to print pastes which are too thin. This latter factor may be the result of print paste being allowed to stand over for long periods before use, or which may be too thin for a particular use. In such cases the cold swelling starch, in granular form, may be added carefully to such print paste, which is than allowed to sit for some time to allow the swelling of the starch granules. On subsequent straining, print pastes which have been so treated can be made use of.

BRITISH GUMS

As already pointed out, there is a wide variety of this type of thickener, ranging from the alkaline gums to very starchy gums. Alkaline gums may require as much as 8 to 10 lbs. per gallon of thickening agent for the production of a printing thickener, while the starchy gums will give good thickening with 1 to 2 lbs. per gallon.

The main objects in using British Gums are the production of levelness and clear definition of printed impressions. These are the results of the high solid content of this type of thickener. On the other hand, the high solid content, together with the reducing action of the dextrine content, brings about a lowering of the color yield, and for these reasons most main print thickeners are compromises between a good color yield and a level print. This must, generally, entail the use of as much starch as possible for the production of a high color yield, modified to some extent by the addition of a suitable percentage of British Gum, to introduce levelness.

UNUSUAL USES OF BRITISH GUMS

On account of their viscous adhesive qualities British Gums find many subsidiary applications in the print shop. For example, in the sticking of the lapping ends on the bowl of the printing machine, British Gum thickening is commonly used. This is an important operation and requires great care, especially when producing large quantities of blotch prints as, for example, in certain types of dress goods and shirting patterns. The

* Reprinted from Canadian Textile Journal.

lapping of a printing machine bowl consists of anything from 4 to 12 rounds of woolen and linen lapping cloth.

To ensure that there is little or no "join", both ends of the lapping should be carefully trimmed. The first end is stuck on the iron bowl of the printing machine after being trimmed and gummed for several inches. On drying, the rest of the lapping is wound on and the last end placed, as nearly as possible, in the same relative position as the first end, with the same amount of gumming and trimming. A badly joined lapping, under the heavy pressures used in the engraved roller technique, especially in shirting styles, will show a "repeat" mark at each revolution of the printing bowl.

A further use for British Gum adhesives is the covering of plaiter rollers to give additional "grip" where cloth is being delivered—for example, from the printing machine drying cylinders and from steaming equipment, etc.

Adhesive gums of this type are also used in the sticking of pieces continuously to the bowl of the printing machine where trouble is experienced in registration, due to cloth shrinkage and distortion. Fine crepe rayons are specially liable to this type of fault and require stabilization on the bowl of the printing machine by this means. British Gums or other adhesive thickeners are applied by means of a finely engraved roller to the backgrey.

The cloth is then fed into the printing machine immediately afterwards and brought into pressure contact with the gummed backgrey to which it adheres, without displacement, during subsequent passage through the various nips with consequent reduction in distortion and greater ease of registration.

THE USE OF "DRY" BRITISH GUM

One of the incidental techniques in color mixing for the preparation of print pastes is known as "dry-gumming." The main idea here is to add calculated quantities of dry thickening material in the form of British Gum to print pastes which are too thin, or which have deteriorated on keeping, in order to restore them to good printing condition. The technique can be applied to almost any type of print paste with the exception of those which contain dyestuffs easily affected by the reducing action of the British Gum. Even in this latter instance, however, this reducing action may be counteracted by the addition of a small amount of oxidizing agent to the print paste.

The technique involves the placing of a weighed amount of the dry thickening agent in the bottom of a container, to which is gradually added, during continuous stirring, small amounts of the print paste which is being treated. This is an important operation and every care should be taken to obtain a smooth paste before the bulk of the print paste being corrected is added. The mixture is now strained and filtered as usual in preparation for printing. If mixing has been carelessly carried out, the results will be poor and will show, in blotch prints particularly, in the form of white specks and, in finer designs, in broken outlines.

The method is used very often to correct outline print pastes which are too thin or have lost "body" as well as in the printing of running lines in the form of stripes. In the latter instance the fault known as "stripping out" occurs occasionally, for various reasons, and the "dry-gumming" technique may be successfully applied in such cases.

It is well known that thickenings with high solid content give better levelling than those containing high percentages of starch. This fact is made use of occasionally in blotch printing with fine white effects which are showing unlevelness and bleeding of the color into the white effects. In cases of this type the addition of a calculated amount of dry thickening to the print paste in the manner just described will bring about a very marked improvement.

The method is also usefully applied in the printing of shirtings where fine printed impressions are of first importance and where colors, for any reason, do not give satisfactory results in this respect. With the vat dyestuffs there is, of course, no danger from the reducing action already referred to, but with Azoics and chrome mordant dyestuffs, in particular, care should be exercised as to the amount added, particularly in the case of light shades.

HAND BLOCK PRINTING

In hand block printing styles where well covered patterns are being used on any type of material, it is sometimes difficult to furnish the face of the printing block with print paste. The main reason for this, in many cases, is that the printing face of the block is uncovered wood, and, unless some slight "roughening" of the block can be carried out, furnishing will be difficult. The fault is specially liable to occur where fine white effects are showing through large masses of color.

In such cases it is impossible to cover the block with fine cotton fabric as is usual in circumstances where this can be done without difficulty. Such cotton fabric coverings give the additional furnishing quality required to the face of the block and well covered printing impressions are easy to obtain. As just pointed out, plain wood surfaces are difficult to furnish and the use of dry thickening in the color will often add just the degree of adhesive quality required to the print paste.

In this connection also it is sometimes the practice for the block printer to use dry thickening shaken over and brushed on to the color sieve, which acts as the furnishing medium for the face of the printing block. This is not a good practice, as in many cases it is carried to excess by the printer who has no means of knowing what type of dyestuff he may be using and its possible reactions in such circumstances.

CRYSTAL GUMS

The type of gum under discussion is that specially prepared in a somewhat similar manner to that described for the cold swelling starches in order to provide a thickening of high solid content, capable of being prepared without boiling. These manufactured gums have special qualities of levelling and produce sharp printing impressions, and, in addition, are very valuable as auxiliary thickening agents. Prepared in the normal way they may be boiled for short periods, to shorten the time of preparation, and may be used along with the reducing agents, alkalis, etc., necessary for vat color printing.

From the point of view of the present discussion, however, the main feature of these thickenings is their capacity for swelling in cold water. This quality makes it possible to add the gum, in a dry condition, to a faulty print paste and, on being allowed to stand for some time, the corrected print paste is filtered and made ready for use. The additional viscosity and adhesive quality thus imparted makes these gums, in many instances, even more valuable for fine outline printing than the British Gums discussed in the previous paragraph.

NATURAL GUMS

Under this heading come Gum Arabic, Gum Tragacanth and the Locust Bean mucilages.

Gum Arabic in powdered form may be used in much the same manner as the Crystal Gums and British Gums for imparting a very high degree of adhesive quality to print pastes. Where special adhesive problems are encountered in the sphere of printing, for example, in lapping ends, combining cloth and backgrey in roller printing or screen printing, and in mounting the cloth on tables in screen printing, this type of gum finds useful application on account of its very high adhesive quality.

TRAGACANTH

This thickening finds extended use as an auxiliary along with starches in vat color printing, and in all cases where the problem of penetration or "push through" is encountered. Another use for tragacanth is in those cases where printing pastes have deteriorated on standing and require additional "body" to make them workable. In such cases the careful addition of a small amount of the faulty print paste to a measured amount of tragacanth already placed in a container will bring about a decided improvement in the quality of the print paste.

It should be pointed out in this latter instance that the addition of the faulty print paste should be made to the tragacanth and not vice versa, continuous stirring being carried out the entire time.

Tragacanth may often be used with good effect where "flushing" of patterns occurs at the edges. This is specially to be noted with reference to cloths which are difficult to penetrate, since in such circumstances print paste tends to lie on the face of the fabric. In these circumstances the addition of tragacanth to a print paste will not only give more "body" to the print paste but will add qualities of penetration which allow the cloth to absorb the latter and so reduce the amount of surface color.

Locust Bean Thickeners: These are used in much the same manner as Gum Tragacanth, especially for purposes of penetration, keeping in mind the fact, however, that they do not withstand alkali so well as the better qualities of tragacanth. They may be used, however, either as auxiliaries or main thickening agents for the printing of cellulose acetate dyestuffs, acid and direct dyestuffs by the Urea process, and chrome mordant dyestuffs by the use of the Universal Mordant process.

VAT DISCHARGE PRINTING

One of the difficulties encountered in this style of printing, especially on diazotized and developed dyed grounds, is the formation of white halos around the discharge pattern. One of the approaches to the prevention of this fault is by means of the use of the right type of thickening agent. Where large amounts of British Gum are used in the thickening, perhaps with the intention of producing a level and clearly defined print, it may be found that the fault of "flushing" or "springing" of the print readily occurs. The main reasons for the fault, from the thickening point of view, are the high solid content and the solubility of a proportion of the thickening. These factors induce the ready absorption of water from the steam during the aging process, and the percentage of dextrose in the thickening, due to a high degree of farination, will induce a ready flow due to water absorption in steaming.

The obvious cure is to reduce the amount of British Gum, or substitute another thickening, which gives equally good thickening without the fault described. One remedy suggested for the foregoing type of fault is the use of the cold swelling starches already discussed. Once this thickening is dried on the fiber it will not flow or run so easily as a more soluble material will. Furthermore, under the influence of steam, it forms a more or less insoluble envelope for the dyestuff in the print paste and "flushing" is reduced to a minimum.

Another point in the use of the cold swelling starch type of thickener for the printing of vat dyestuffs is that this type of thickener does not absorb moisture so readily from steam. In view of this fact additional amounts of glycerine, urea, or other water absorbing agents are necessary when using vat colors either in direct or discharge styles.

For example, in the production of vat color discharge prints on Azoic dyed spun rayon fabrics, it will be found that there is little or no danger of "flushing," and it will be necessary to make such additions of hygroscopic agents to the print paste in order to get the full effect of the vat dyestuff when using cold swelling starches.

• PATENT DIGEST •

CELLULOSE ZINCATE SOLUTIONS—Chloroaliphatic Compounds Added.

G, 2, 01

U S Pat 2,536,334
(S M Edelstein, E Weiss—Jan 2, 1951)

Solutions of cellulose in sodium hydroxide containing zinc oxide (therefore, sodium zincate) have frequently been proposed for obtaining permanent finishes, sizes or the like (cf U S Pat 2,419,341, *Am Dyestuff Reptr* 36, 546 (1947); U S Pat 2,442,973, *Am Dyestuff Reptr* 37, 772 (1948); Ger P 749,082, *Am Dyestuff Reptr* 35, 460 (1946); Swiss Pat 244,321, *Am Dyestuff Reptr* 37, 538 (1948), and so on). These solutions generally have to be prepared at relatively low temperatures (at about 5°C); they are not uniform and are mostly unstable, gelatinizing after a short time.

According to the present invention, the cellulose zincate is dissolved in the presence of small amounts of chloroaliphatic short chain compounds (for example, chloroacetic acid or esters thereof, chloroacetaldehyde, ethylene chlorohydrin . . . $ClCH_2—CH_2OH$, epichlorohydrin . . . $ClCH_2—CH—CH_2O$ or the like). It is claimed that, in this event, the solutions become homogenous and nongelatinizing in storage and, therefore, particularly suitable for finishing textiles. Zinc oxide is dissolved at 110°C 1:3 in NaOH in concentrated state (the NaOH content being not less than 20 per cent); cellulose is introduced in this solution and a small amount of the aforementioned chloroaliphatic compound is added. The mixture is kept for 2-24 hours, then diluted with water to an NaOH-content not over 10 per cent. The total zinc oxide content is given as 5-15 per cent. Figures reported in one of the examples are: 1.5 kg short cut viscose waste fibers and 35 kg sodium zincate solution (21.5 per cent NaOH, 7.0 per cent ZnO, 1 kg ethylene chlorohydrin) diluted with 59 kg water at room temperature. This solution is used for impregnating cotton muslin. An aftertreatment with mercerizing lye gives a typical transparent finish, while in a passage through an acid salt solution, a linen-like finish is obtained by precipitation.

No theoretical discussion of this process is offered. It can be assumed however, that alkali cellulose formed in the strongly alkaline solution is at least partly transformed into a compound of the carboxy

PAUL WENGRAF

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ethyl cellulose or hydroxy ethyl cellulose type, which reacts further with the zincate solution.

References cited by the Patent Office, among others:

U S Pat 2,465,520 (1949—Edelstein): dissolving cellulose ethers in sodium zincate solutions for finishing purposes (cf *Am Dyestuff Reptr 38,* 479 (1949).

U S Pat 2,416,998 (1947—Aspinook Corp): using cellulose zincate printing pastes as resists in shrinking processes (cf *Am Dyestuff Reptr 36,* 366 (1947).

U S Pat 2,322,427 (1943—Edelstein): preparing a solution of cellulose by mixing nonmodified cellulose with an aqueous solution of sodium zincate containing an excess of NaOH at temperatures up to 5°C and warming to room temperature.

U S Pat 2,289,085 (1942—American Enka): producing shaped cellulose structures by dissolving the cellulose in alkali stannates or zincates at low temperatures, aging the cellulose until completely dissolved and spinning the filaments in sulfuric acid plus Na-, Zn- and aluminum sulfate.

Reference is further made to U S Pat 1,630,365 (Westinghouse Electric), which describes a parchmentizing process for cellulosic fibers with zincates, stannates and the like.

ROLLER FOR PRINTING MACHINES——Covered with Spongy Rubber D, 3

Brit P 648,275
(Dayton Rubber Co—Jan 3, 1951)

A roller (5), which is particularly useful in textile printing machines, is mounted on an axle shaft (4)—see Fig 1. This roller is composed of an inner, nonporous layer (6) made of natural or synthetic rubber and surrounded by another layer (7) containing uniformly distributed pores. The essential innovation of this patent is that the inner layer is first vulcanized on the axle as usual, after which a mixture of synthetic rubber (eg, neoprene or butadiene polymers) with a water soluble salt, preferably NaCl or Na_2SO_4, is prepared to cover the inner layer and vulcanized again on this substratum. Thereupon the salt crystals formed in the new layer (7) are leached out with water, preferably under high pressure. It is important to use relatively high percentages of salt (200-300 p on 100 p rubber polymer) to obtain large pores in this layer. Leaching out under considerable pressure and working with a high content of water soluble salts has the effect of producing interconnected pores of substantial dimensions and permits penetration of any rinsing liquid down to the inner layer (5). This effect is best demonstrated in Fig 2.

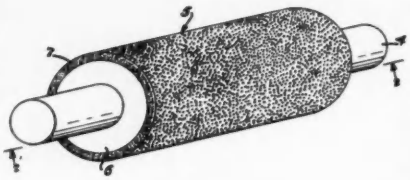


Figure 1
British Patent 648,275

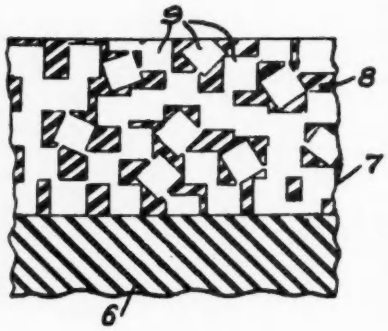


Figure 2
British Patent 648,275

The present specification mentions as references British Patents 563,374 and 496,585. These describe rubber rolls as used in the prior art, that consist of metallic cores surrounded by layers of vulcanized rubber. Neither was found to refer to a rubber roller made up of a nonporous inner roller covered by a spongy rubber layer.

Further reference is made to German Patent 647,615 or French Patent 824,896 (E R Müller). These describe transporting rollers covered with spongy rubber for use in dyeing machines.

DYEING NONSUBSTANTIVE DYES——Dispersed in Cellulose Ethers, Preferably Hydroxy Ethyl Cellulose C, 1

Brit P 649,140
(Dan River Mills, Inc—Jan 17, 1951)

This patent is very similar to U S Pat 2,448,515 (cf *Am Dyestuff Reptr 38,* 110, 1949). It may be recalled that this method is based on the observation that cellulose ethers quite generally have the property of dissolving various groups of dyestuffs and maintaining them in solution even when the composition is dissolved in other media. The dyed cellulose ether can therefore be subsequently dried and dissolved in alkalis under equal conditions as noncolored cellulose ethers—mostly at low temperatures.

The present specification suggests the use of hydroxyethyl-celluloses, one type of these ethers being soluble at freezing temperatures and the other one at room temperatures. Surprisingly, no separation of dyestuff and cellulose ether occurs when this composition is dissolved in alkali. Dyeing is effected by padding and then precipitating the ether in an acid bath. Dyestuffs recommended for dyeing the cellulose ether include Naphthol Red (by first impregnating with naphthol, then with the diazotized color base), Anthraquinone Vat Blue (C I 1113), Chlorantine Fast Green BLL (Prototype 425), Calcogene Black 53 CF (C I 978) etc. Combinations of different dye groups, to obtain tan, bluish-green, etc shades, are also within the scope of this invention.

Although some dyestuff preparations that are based on cellulose derivatives (especially sodium cellulose glycollate) have formerly been described (cf U S Pat 1,979,469, Du Pont or Brit P 424,685, Imperial Chemical Industries), no reference could be found which disclosed that this type of composition could be clearly redissolved in alkalis without subsequent separation of the components useful (in that form) for pad dyeing.

SHRINKPROOFING WOOL——Alkaline Peroxide Pretreatment, Aminoresin Aftertreatment A, 2, 04

U S Pat 2,539,365
(American Cyanamid—Fluck, Lynn, Schumann—Jan 23, 1951)
U S Pat 2,539,366
(American Cyanamid—Fluck, Lynn, McPhee—Jan 23, 1951)

Both these patents refer to a shrinkproofing treatment consisting of (1) an immersion in an aqueous or alcoholic solution of a peroxy compound and (2) a treatment with an amino resin precondensate or condensate.

Many references concerning the prior art in wool shrinkproofing processes are reported in these specifications. The inventors state that reacting of wool with any kind of oxidizing agents (chlorites, hypochlorites, peroxides, permanganate) is known *per se.* On the other hand, literature is cited in reference to shrinkproofing methods with melamine- or urea-formaldehyde condensates. The essential advantage in using these combined methods (as described in the present patents) is that a lesser amount of aminoresins can be employed in step "2" when the textiles are prepared as indicated in step "1." Other advantages are the uniform results obtained and the ability to render shrink-resistant even those types of wool which

did not hitherto show satisfactory shrink-resistance with the application of standard methods. The reasons behind this superior shrinkproofing effect are not quite understood, but it is assumed that physical and/or chemical modifications of the wool material occur in the pretreatment (step "1"), improving the wettability and thus the penetration by the solution used in step "2." Such modifications, whatever their nature may be, persist after washing (and even after dyeing) so that a dyeing process may be inserted between steps "1" and "2" without impairing the final shrinkproofing effect.

Peroxy compounds, as required in step "1", can be used in a wide range; examples: inorganic or organic peroxides, perphosphates, persulfates, percarbonates, organic peracids, etc, employed in a concentration equivalent to 0.1-0.2% hydrogenperoxide and at a pH between 9-11 for at least 15 minutes. In certain cases, however, the immersion time may be extended for hours and even for several days at varying temperatures (110-160°F). The goods are then washed alkali-free with water or diluted acids.

While the pretreatments (termed as step "1") are analogous in both co-pending patents, they differ substantially in the aftertreating method of step "2."

U S Pat 2,539,365 suggests the use of heat curable noncationic aminoplasts, especially methylated methylolmelamines, which are at least partly soluble in water; a potentially acid catalyst (diammoniumphosphate) may be added, whereupon the dried material is cured as usual at temperatures up to 400°F. This type of condensate, which was first proposed for shrinkproofing wool, is fully described in Reissue Patent 22,566 (1944—Cyanamid, Johnstone).

U S Pat 2,539,366 recommends the use of colloidal solutions of cationic aminoplasts made hydrophilic by adjusting the pH to 5-6. Such condensates are prepared according to U S Pat 2,345,543 and 2,356,718 (Cyanamid, Wohnsiedler) by condensing 2-2.5 mols formaldehyde with one mol melamine. Condensates of this type are characterized by the forming of clear colloidal solutions in water and acids when freshly prepared; they pass upon aging through stages of hydrophilic-, water dispersible-, and finally into a water insoluble modification.

The effects of these prepartions are demonstrated in tables. Warp shrinkages of 20%, measured in untreated control samples, dropped in some cases to 3% after one of these treatments.

Among other references cited by the Patent Office:

(To U S Pat 2,539,365):

U S Pat 2,467,233 (1949—Montclair Research): applying a synthetic polymer of 1-3-butadiene and a urea- or melamine-formaldehyde condensate under specific conditions as a shrinkproofing emulsion for wool.

U S Pat 2,395,791 (1946—Cluett, Peabody & Co.): a shrinkproofing wool method comprising a pretreatment with an alcoholic potash solution and an aftertreatment with a stabilized resin precondensate (Beckamine P-424; Cf *Am Dyestuff Reptr 35*, 336 (1946).

U S Pat 2,395,724 (1946—Tootal Broadhurst): pretreating with a resin condensate and aftertreating with an oxidizing agent (Cl, Br, hypochlorite; Cf *Am Dyestuff Reptr 35*, 336 (1946).

U S Pat 2,329,651 (1943—Rohm & Haas): stabilizing knitted goods with urea-formaldehyde condensed with alcohol or glycol under acid conditions.

U S Pat 2,329,622 (1943—Cyanamid): shrinkproofing wool with water-soluble, alkylated methylolmelamine solutions in unpolymerized state, followed by curing. (See the reissue patent of Cyanamid-Johnstone #22,566, quoted above).

Brit Pat 533,923 (1943—Bleacher's Ass'n Lim): shrinkproofing wool with peroxides at a pH of 8-12.

Brit Pat 408,985 (1934—Merkel & Kienlin): waterproofing wool by (1) using hydrochloric acid plus chloride of lime as oxidizing agents, and (2) treating with aluminum acetate.

(To U S Pat 2,359,366):

U S Pat 2,423,429 (1947—Cyanamid): improving the bonding properties of noncellulosic fibers (wool, nylon, silk) with melamine-formaldehyde in a solvent comprising a watersoluble polyalcohol (glycol or glycerol).

Most of the references cited with U S Pat 2,359,365 also apply.

CREASEPROOFING NYLON——Aftertreatment with Formaldehyde Vapors G, 2, 04

U S Pat 2,540,726

(Du Pont—Graham Schupp, Jr—Feb 6, 1951)

Although nylon is widely used in the manufacture of textiles, the fabrics are reportedly not entirely satisfactory as far as their drape, softness, wrinkle resistance and resilience ("liveliness") are concerned. Heat setting of nylon goods (e g, as described in U S Pat 2,365,931), consists of heating the fabrics slightly below the fusion point of the fibers. This was found to improve some of the forementioned deficiencies, but the resilience was still not sufficient.

According to the present invention, all-nylon fabrics or mixed goods containing other fiber material besides oriented nylon were produced with increased liveliness, fullness, crease- and solvent-resistance by impregnating the heat-set fabrics with an acidic catalyst and then exposing the fabrics, in the absence of moisture, to vapors of formaldehyde at 100-250°C. Examples of acid catalysts are ammonium chloride or oxalic acid of a pH below 3.0. After the removal of excess catalyst by passing through rolls, the fabrics are dried at low temperatures (below 30°C) while sufficient tension is applied to prevent wrinkling or shrinking. The treatment consists of a 15-30 minute passage through dry hot formaldehyde vapors of 130-150°C, which are generally produced by heating paraformaldehyde or a slurry of paraformaldehyde in mineral oil in a closed chamber. Finally the acid catalyst left in the goods is removed by rinsing. The nylon-containing fabrics are soaked with a swelling agent such as ethylene glycol prior to their impregnation with the acid catalyst.

It is interesting to note that this treatment also improves the affinity for acid dyes, for instance, du Pont Anthraquinone Blue RXO (C I #1076). Certain variations of this method have unexpected effects: in omitting the heat setting preparation a stiffer fabric results, in drying the fabrics without tension the affinity to acid dyes is lowered rather than raised, and none of the forementioned effects claimed in this method can be attained in using moist formaldehyde or in omitting the acid catalyst.

Among other references cited by the Patent Office:

U S Pat 2,434,247 (1948—Imperial Chemical Industries): producing elastic nylon articles by heating them under anhydrous conditions in an undrawn state to 80-150°C in the presence of lower alcohols and formaldehyde vapors.

U S Pat 2,430,953 (1947—du Pont): reacting undrawn polyamide fibers at 40-130°C with a formaldehyde solution below pH 3 and an oxygen-containing acid catalyst (oxalic acid) in alcohol. 1-20% of the amide is converted into methylolamides.

U S Pat 2,311,080 (1943—du Pont): impregnating viscose with formaldehyde in an indifferent solvent, thereby lowering the affinity for cotton dyes.

Brit P 463,472 (1937—I G Farbenindustrie): hydrophobing cellulosic textiles with condensates of phenols, cresols, octylcresol, isododecylphenol, etc and formaldehyde.

Reference is made further to du Pont's U S Pat 2,441,085 (1948) (Cf *Am Dyestuff Reptr 37*, 768 1948), which protects a creaseproofing method for nylon by preparing the goods in methanol-formaldehyde solutions.

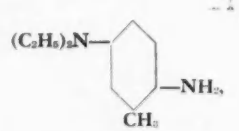
PRINTING TEXTILES——Photographic Method Using Diazonium Salts and Zinc Chloride D, 1

U S Pat 2,541,178
(General Aniline & Film Corp—Slifkin—Feb 13, 1951)

Methods for producing patterns on textiles by photographic methods, omitting the standard equipment of roller printing machines, screen printing devices and so on, have been described previously. The present invention does not refer to special equipment for carrying out one of these processes, but to the chemical improvements in this art. Hitherto, certain light sensitive diazonium compounds blended with couplers have been used for impregnating paper, whereby the diazonium compound was rendered inactive on the areas exposed to light so that coupling occurred later merely on the areas where the diazonium compounds were not influenced by light rays.

It is pointed out that the above method, which is generally satisfactory in printing paper, did not give prints of sufficient gradation, fastness and contrast of colors on textiles. A solution to this problem was found and variegated shades obtained on textiles by adding zinc chloride to the diazonium salt-coupling component composition. The fabric is impregnated with this blend, exposed to light under a pattern and developed by a suitable alkaline aftertreatment. Zinc chloride was found to reduce yellowing of the noncolored areas, i e, those where the diazonium compound became inactive. It further improves coupling of the azo-components and helps to obtain saturated shades. The concentration of zinc chloride in the impregnating bath is given at 5-10% (wherein the quantity of zinc chloride used for forming zinc chloride double salts of diazonium compounds is not included).

Example: a blue photographic print is produced by preparing cloth with the zinc chloride double salt of diazotized p-diethylamino-o-toluidine



2-3-dihydroxy naphthalene, 5% citric acid (to prevent premature coupling in storage) and 5% zinc chloride. After drying, the goods were exposed under a film carrying the photographed pattern and then developed in an atmosphere of ammonia. Coupling took place in the nonexposed areas only. The prints were well gradated and fast to washing.

Through selection of other diazonium components and couplers, red, sepia, green, purple, blue, etc, prints could be obtained in an analogous way. These shades could also be combined with one another to produce cross prints or mixed three-tone effects by impregnating the cloth subsequently with different diazonium solutions or by applying this printing method to fabrics predyed in contrasting shades.

Among other references cited by the Patent Office:

Various diazonium compounds used in photographic printing methods are quoted. These include:

U S Pat 2,350,843 (1944—Eastman Kodak): diazocompounds of amino phenyl pyrrolidine, stable under all ordinary conditions but decomposed under the influence of light.

U S Pat 2,196,950 (1940—Kalle & Co): 2-3-dioxynaphthalene as a component in photographic printing methods.

U S Pat 2,156,069 (1939—General Aniline): cellulose acetate fibers containing vinyl polymers embedded in the fiber substance. The vinyl polymers contain salt-forming groups and are dyed with Rapidogens.

Diazo amino- or diazo imino components are proposed for the use in emulsion printing technique as described in U S Pat 2,309,946 (1943—Interchemical Corp). These are dispersed in the aqueous and in the oily phase separately.

Developing with ammonia is recommended in U S Pat 2,228,562 (1941—Dieztgen Co).

Production of variegated designs by superposition of stabilized diazotype colors is described in Kalle's Brit P 299,010 (1930).

Mechanical equipment for printing textiles has been mentioned in *Am Dyestuff Reptr 38,* 476, 1949 (Swiss Pat 251,099, Seligmann). Impregnation with a stiffened light-sensitive diazocompound, followed by exposure and dyeing out in a coupling composition was recently reported in *Am Dyestuff Reptr 40,* 66, 1951 (Brit P 640,308—Holden).

STABILIZING CELLULOSIC TEXTILES——(Shrinkproofing)—Aldehydes, Acid Catalyst, Alkalisulfate G, 2, 04

U S Pat 2,541,457
(Alrose Chemical Co—Beer—Feb 13, 1951)

This patent cites the prior art of dimensional stabilizing and creaseproofing cellulosic textiles or mixtures of these fibers with limited amounts of cellulose esters. A group of these methods comprising aldehyde-treatments in the presence of acidic catalysts is specially discussed in the preamble, which also mentions the inventor's U S Pat 2,484,545 (1949). This protects the use of water-soluble alkali salts of oxidizing properties (alkalichlorates) combined with glycol to decrease the loss of tensile strength in the subsequent baking process (cf *Am Dyestuff Reptr 39,* 97, 1950). It has been observed that the fiber protection that results in this process might, nevertheless, not be sufficient when the baking temperatures rise to 150° C or more. Fiber damage has been especially experienced in the subjecting of cotton material to temperatures in this range.

The present patent suggests the addition of an alkali metal sulfate to the forementioned aldehyde-acid composition. Even very small amounts of sulfate (about 0.1%) have a surprising effect. The sulfate concentration is limited to 5-10% since higher concentrations might interfere with the shrink- or crease-resistant result. All traces of starch, gum, resin or other sizing agent have to be removed before the aldehyde treatment. Aliphatic aldehydes (e g, formaldehyde, glyoxal, etc) or aldehyde developing compounds, such as hexamethylene tetramine, are included; recondensates of aldehydes with urea, phenol or the like are not. Examples of acid catalysts used include oxalic acid, citric acid or acid salts (e g, ammonium salts of inorganic acids that liberate ammonia in baking).

One of the included examples calls for a preparation with (a) 120 g HCOH plus 8 g per liter, and (b) the same ingredients mixed with 20 g sodium sulfate. The shrinkproofing effect is said to have been adequate in both events but the tensile strength was measured for cotton with 34 lbs for sample (b) against 26 lbs for sample (a). The corresponding figures for spun rayon were 68 lbs for sample (b) against 33 lbs for sample (a).

Among other references cited by the Patent Office:

U S Pat 2,484,545 (Alrose Chemical Co): see above.

U S Pat 2,108,520 (Böhme-Fettchemie): creaseproofing textiles by using acid formaldehyde solutions and subjecting the fabrics to a heat treatment.

U S Pat 2,080,043 (1937—Du Pont): a crush-resistant pile fabric composed of piles creaseproofed with formaldehyde. The backing, natural silk fabric, is not sensitive to the action of the aldehyde.

U S Pat 1,989,100 (1935—Lilienfeld): impregnating viscose threads with alkalis or alkali salts, especially sulfides, to improve the crush resistance.

SHRINKPROOFING WOOL—— Treatment with Inert Suspensions of Opposite Electrical Charge A, 2, 04

U S Pat 2,541,780
(Bollman & Co—Reider—Feb 13, 1951)

This method is based on treatment with suspensions of inert, finely divided substances, which will clog the surface scales of the elemental wool fibers, thus eliminating the "differential frictional effect" and preventing shrinking of the material by mechanical means. It is pointed out that the suspension of inert substances as abrasive agents has been propagated heretofore, especially with the use of silica or carborundum (cf USP 2,438,328 of Fuller's Earth Union Lim, *Am Dyestuff Reptr* 37, 630, 1948). These preparations were applied, however, to destroy the scales by abrasion; the present invention covers a method for filling the interstices between the scale with inert substances. Optionally, the inert compounds can be formed *in situ* on the scales, e g, by precipitating Ba- or Ca- sulfate or lead chromate.

Since these inert substances (the insoluble salts of the barium sulfate type included) do not adhere to the scales structure, but just fill the spaces between the scales, it is mandatory that they be fixed more or less firmly during the following wet treatment. This effect is brought about by imparting inverse charges to the fibers and to the inert material. Consequently, wool treated with acid solutions to obtain a positive charge of approximately pH 3.5 has to be aftertreated with a suspension having an electronegative charge; an electro-positive suspension of the inert substances has to be applied on wool bearing an electronegative charge. The finely subdivided substances are eventually removed under reverse (acid or alkaline) conditions. Detergents used in this last step should be of the nonionic or cationic type when a negatively charged suspension is used, while anionic detergents should be employed after a treatment with positively charged suspension to change the polarity of the wool fibers.

Suspensions of a typical electronegative charge are those containing Bentonite, Fuller's Earth, silica, carborundum or one of the precipitated metal salts. Cationic suspensions such as the ion exchange resins are mentioned as carrying a positive charge.

Example (for the first type of preparation): woolen socks are treated with finely divided titanium dioxide at a pH of about 3.0 by adding acetic or sulfuric acids. This suspension will adhere normally to the wool, which attracts the particles, particularly when the washing process is effected in the presence of nonionic or cationic detergents. Finally, the suspended substances are removed by washing with an alkaline detergent, thus reversing the initial charge of the wool material.

Among other references cited by the Patent Office:

U S Pat 2,438,328 (Fuller's Earth Union Lim): shrinkproofing wool by the use of abrasive substances (see above).

U S Pat 1,947,024 (1934—American Smelting and Refining Co): shrinkproofing woolen fabrics by immersing them in a colloid solution of a metal salt, e g, barium sulfate, and drying; the wool shrinks and the scales of the wool are charged.

U S Pat 1,732,729 (1929—Kohnstamm & Co): bleaching fabrics by applying silica compounds of porous structure during the laundering operation with the bleach, which consists of chlorine liberating substances.

ACRYLONITRILE FIBERS—— Vat Dyeing in the Presence of Aromatic Amines C, 4, 07

U S Pat 2,543,994
(Du Pont—Thomas—March 6, 1951)

Vat dyes of the indigoid, thioindigoid or related types (but not those of the anthraquinoid group) are applied from vats containing, besides alkali and reducing agents, an aromatic amine such as p-aminodiphenyl, β-naphthylamine, m-toluidine, N-methylaniline, and so on. The leuco vat is reoxidized by a treatment with 1% nitric acid at 97-98° C.

Example: a fiber, consisting of 95% acrylonitrile 5% 2-vinyl pyridine, was dyed at 97-98° C in a dyebath containing 20 p tetrabromoindigo, 100 p sodiumhydrosulfite, 40 p NaOH and 160 p N-methylaniline in 4000 cm³ of water for one hour, after which it was rinsed and oxidized as mentioned above. A strong blue shade resulted.

Among other references cited by the Patent Office:

U S Pat 2,431,956 (1948—Du Pont): dyeing acrylonitrile polymers by treating first with a naphthol, then with acid, and finally with a diazotized base.

U S Pat 2,404,727 (1946—Du Pont): an organic solvent solution of polyacrylonitrile (at least 85% in a copolymer) as a laminating or coating agent.

U S Pat 2,362,375 (1944—American Viscose): dyeing vinyl chloride-acetate polymers with suspension dyestuffs in the presence of aromatic amines, such as naphthylamine, amino diphenyl, etc.

U S Pat 2,347,508 (1944—Carbide & Carbon): dyeing vinylchloride-acetate copolymer fibers at elevated temperatures under tension in an aqueous bath containing a solvent. The solvent is present in a sufficient amount to soften, but not to disrupt, the fiber structure. Examples are: methylisobutyl-ketone or cyclohexanone.

Brit P 583,939 (1947—Imperial Chemical Industries): dissolving acrylonitrile spinning solutions in solvents, or in aromatic amines, among others.

Brit P 479,867 (1938—Dreyfus and Moncrieff): dyeing cellulose acetate with reduced dyes containing as a basic component of the leuco compound a nonalkaline water soluble organic liquid or ammonia.

Reference is made further to Brit P 576,793 (Imperial Chemical Industries), which suggests the dyeing of acrylic polymers with typical acetate dyes (Duranol, Dispersol) by using amines as dispersants, e g, aniline. This patent does not apply to vat dyeing. Cf *Am Dyestuff Reptr* 35, 504 (1946).

DYEING VINYL-ACRYLONITRILE POLYMERS ——Heat Aftertreatment C, 4, 07

U S Pat 2,543,316
(Union Carbide & Carbon—Field, Jr, Schoonover —Feb 27, 1951)

This invention is mainly concerned with acetone-soluble fibers composed of vinyl chloride co-polymerized with acrylonitrile. The percentage of the components is given as 45- 80% polyvinylchloride. Specific viscosity of the fiber applied is listed as 1.5-6.0 at 20° C in a solution of acetonyl acetone. The fibers are prestretched at temperatures of 105-150° C and thereupon dimensionally stabilized in water or steam of 100-120° C. The yarns so treated become partially or wholly resistant to acetone and various other solvents.

These filaments can readily be dyed with typical acetate dyestuffs but have low affinity for other dyestuff groups, e g, acid, basic or direct dyes, which produce dyeings of poor wash- and crock resistance. It is disclosed by the inventors, nevertheless, that satisfactory results are obtained by first dyeing at elevated or at moderate temperatures and then heat-treating in the presence of moisture.

The dyebath contains 1-5% dyestuff, a small amount of soap (optional), a sequestering agent (e g, Calgon) and sodium sulfate to promote exhaustion. The dyebath is brought to 90-100° C and the fibers immersed therein for 5-10 minutes. After this step, termed the "initial dye application", the goods are subjected either to (a) a temperature of 105-125° C in the presence of water or steam under pressure or (b) to 125-150° C under atmospheric pressure in the presence of superheated, moisture-containing steam. This second step is preferably carried out after the material is removed from the first

dyebath. It is essential that moisture be present throughout the entire process: the use of dry heat does not give any improvement in depth of shade or color fastness. It has been further observed that aftertreatment (a) with water or steam under pressure produces dimensionally stable fibers at temperatures up to 125° C, while in treatment (b) this stability is retained even at temperatures up to 150° C.

Four classes of dyeings, which are used to give good results, are enumerated: acid dyes (e g, Calcocid Milling Red 3 R Conc, C I #275 or Alizarine Direct Blue ARA); direct dyes (Calcomine Scarlet 3 B C I #382 or Calcomine Fast Green B G Conc, C I #583); basic dyes (Bismarck Brown or Victoria Blue) and phthalic anhydride-type dyes (Rhodamine or Astraphloxine).

Example: a knit fabric made from the forementioned copolymers 60.3% vinyl-chloride content) is dyed for 10 minutes in a boiling dyebath of 1% Calcocid Milling Red 3 R conc and 2% sodium sulfate. Thereafter the dyebath is brought under pressure to 120° C and dyeing is continued for two more hours. A full red shade, fast to boiling, soap solutions and crocking results.

Among other references cited by the Patent Office:

U S Pat 2,468,081 (1949—American Viscose): an apparatus for continuously plasticizing and softening yarns by running them through a narrow tube filled with super-heated vapors.

U S Pat 2,420,565 (1947—Carbide & Carbon Chemical Co); stretch spinning textiles from a copolymerized material of vinylchloride and acrylonitrile (Vinyon N).

U S Pat 2,080,254 (1937—Celanese): dyeing acetate of cellulose fibers with dyes that have low affinity for this fiber, e g, a vat dye, by impregnating the material with the reduced dye solution and subjecting the fabric to a temperature of 150-180° C to improve penetration.

Brit P 445,345 (1936—H Dreyfus): coloring textile material, which has been impregnated with a synthetic resin, by applying thereto an unsulfonated, water insoluble dyestuff (azo dyes, acetate dyes) dispersed in Turkey Red Oil or dissolved in CCl_4.

Dyeing of nylon or other superpolyamide fibers with acetate dyes and increasing the depth of shade and the fastness in a steam aftertreatment has further been proposed in U S Pat 2,474,890 (Celanese) (cf *Am Dyestuff Reptr 38*, 756, 1949). This method has not been applied, however, to acrylonitrile-polyvinyl fibers.

Book Reviews

THE CONDENSED CHEMICAL DICTIONARY

Fourth Edition; F M Turner, Editorial Director
726 pages; $10.00
Reinhold Publishing Company, New York (1950)

Previous editions of this well-known work of reference are familiar volumes to most chemists; now the fourth edition, uptodate and enlarged by 5,000 new items, is available.

Among the thousands of items defined and described are many chemical specialties sold under trade names such as: "Antilac," "Beaconol," "Ethofats," "Helindon," "Nacconol," etc. Very complete descriptions of many of these products are given, such as chemical type, uses, color, physical form, physico-chemical constants, grades, containers, shipping regulations, and a reference to the manufacturer. Naturally the technical information on these products is supplied by the manufacturer.

In addition to the descriptions of these brand name products, descriptions are given of various chemicals listed according to their popular name, such as "mordant rouge," "sal ammoniac," "Glaubers salt," etc. Of course the conventional terminology of chemicals, chemical methods, and chemical processes are given complete treatment.

Arranged in typical dictionary fashion with the entry in bold face type, completely cross-indexed, and with thumb tabs for each letter of the alphabet, the volume is made for maximum facility of reference.

Initial brief chapters on the "Transportation of Explosives and Other Dangerous Articles" and "A Guide to the Pronunciation of Chemical Names" are a useful supplement to the dictionary proper.

This volume, containing as it does thousands of entries of interest to the textile chemist, certainly should be available on the laboratory book shelf.—JBM

PRACTICAL MICROSCOPY

Second Edition. L C Martin and B K Johnson
124 pages; $2.50
Chemical Publishing Co, Inc, Brooklyn, New York (1951)

It is felt that the name of this brief treatise on the microscope is a misnomer, if we consider the term practical microscopy to mean applied microscopy; for the content deals primarily with the optical principles of the microscope and with methods of illumination of the object, including a short discussion of phase-contrast illumination. However, no attempt is made to cover any particular field of microscopic technique, although there are many references to microbiology for purposes of illustration. This book is intended for a person having no knowledge of the fundamentals of the microscope, and it is admirably suited.

The contents are divided into fourteen brief chapters, of which the first four cover optics. Following these there are two on illumination, and individual chapters on photomicrography, the metallurgical microscope, preparation of microscope specimens, binocular microscopes, polarized light, ultra violet microscopy, interpretation of image, and the electron microscope. This last chapter, although brief of necessity, presents a good description of the operation and capabilities of the electron microscope.—JBM

HETROCYCLIC COMPOUNDS VOLUME II

Edited by Robert C Elderfield
571 pages; $15.00
John Wiley & Sons, Inc, 440 Fourth Ave, New York 16, N Y (1950)

Volume II is a continuation of a much needed series collecting a wealth of knowledge, which is contributed by several eminent men in the hetrocyclic field. This book deals with the polycyclic compounds containing one oxygen or sulfur atom. The material is based on experimental fact and is presented in terms of modern organic chemistry concepts. Like the preceding volume, any subject which is adequately covered in some available publication is introduced only where clarity of an explanation dictates. This series is a must for all chemists, especially those who deal with natural products.—TFK

Proceedings of the
American Association of Textile Chemists and Colorists

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JUNE 11, 1951

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Calendar of Future Meetings

COUNCIL: June 26 (Hotel New Yorker, N Y); Oct 18 (Hotel Statler, N Y); Nov 16 (Hotel New Yorker); Jan 18, 1952, April 18, 1952, June 20, 1952, Sept 19, 1952 (all in New York); Nov 6, 1952 (Boston).

GENERAL RESEARCH COMMITTEE: (Same dates and sites as Council).

NATIONAL CONVENTIONS: 1951—October 17-19, Hotel Statler, New York, N Y; 1952—November 6-8, Boston, Mass; 1953—Sept 17-19, Hotel Stevens, Chicago, Ill; 1954—Atlanta, Ga.

HUDSON-MOHAWK SECTION: June 22 (Annual Outing, Wolfert's Roost Country Club, Albany, N Y); Sept 21 (Jack's Restaurant, Albany); Oct 26 (Hotel Utica, Utica, N Y); Dec 7, Feb 1, 1952, Mar 21, 1952, May 2, 1952 (all at Jack's Restaurant); June 20, 1952 (Annual Outing).

MID-WEST SECTION: June 16 (Outing, Lake Lawn Lodge, Delavan, Wis); Sept 29 (Morrison Hotel, Chicago, Ill).

NEW YORK SECTION: June 15 (Outing, North Jersey C. C. Wayne Twsp, N J); Sept 28 (Swiss Chalet, Rochelle Park, N J); Nov 30 (Swiss Chalet); Jan 11 (Hotel New Yorker); Feb 29 (Hotel McAlpin, New York); April 11 (Swiss Chalet); May 16 (Swiss Chalet); June 20 (Outing).

NORTHERN NEW ENGLAND SECTION: Oct 25 (LTI, Lowell, Mass); Nov 30 (Annual Meeting, Boston, Mass).

PHILADELPHIA SECTION: Sept 14, Oct 26, Dec 7, Jan 18, 1952 (all at Kugler's Restaurant, Philadelphia).

PIEDMONT SECTION: June 29-30 (Outing, Myrtle Beach, S C); Sept 22 (Annual Meeting, Charlotte, N C).

RHODE ISLAND SECTION: June 22 (Outing, Wannamoisett C C); Oct 26 (Providence Engineering Society); Nov 16 (Johnson's).

SOUTH CENTRAL SECTION: August 24-25 (Outing); Dec 1 (Hotel Patten).

SOUTHEASTERN SECTION: Sept 8 (Columbus, Ga); Dec 8 (La Grange, Ga).

WESTERN NEW ENGLAND SECTION: June 22 (Outing).

Northern New England Section——

STANDARDIZATION OF DYES*

GEORGE H SCHULER

Director, Technical Laboratory of the
Organic Chemicals Dep't, E I du Pont de Nemours and Co, Inc

IN THE manufacture of dyes there is a great deal of work that is not glamorous, much of which is performed or supervised by technically trained personnel. This is one reason there are relatively so many technical graduates at every dyestuff plant. Controls are set up for each step of every process, and still the end products are not always uniform. Since a large integrated plant may produce close to a thousand chemically distinct dyes, in the making of which there is involved the production of several hundred chemically distinct intermediate products, it is not surprising that controls are on a grand scale. The final step in finishing dyes is a process usually referred to as standardizing, which involves the general steps of grinding, mixing and testing to insure that the packages that go to the shipping house contain material like the standard set up for each product in all properties significant to its end uses. It is of this standardizing process that we talk tonight.

Of course, with so many process controls there are some products that run for periods with remarkable uniformity. While this lasts, standardizing these products is easy, as only check tests are needed to determine that the process has not gone off and that the product continues to be of uniform quality. Products that are finished in crystalline form are most likely to be found in this category. Even crystalline products, however, have to be followed carefully in order to detect the start of any trend away from standard quality. Since standards are set rather high for these usually dependable products, any significant deviation results in substandard material which may be difficult to work off later. As substandard products become dead stock for some time with no production credit and as then nothing is available for shipment, a good standardizer is constantly alert to warn of the danger of substandard production.

George H Schuler

An important part of dye manufacture before a final product is put into containers for shipment to customers is standardization. This subject is discussed by a speaker who has had more than thirty years of intimate experience in this phase of dye technology.

In order that the user of a dyestuff may repeatedly get the same results from his formulas for dyeing or coloring in many fields, including textiles, it is necessary that dyes be very carefully standardized not only for both shade and strength but for many other properties dependent upon the class and possible use of the products for particular purposes. The general manner in which standardization is carried out, the great variety of tests involved, the degree of accuracy expected in the determination of dyeing strength, and the use of auxiliary testing methods are explained.

Complications stem from the facts that some products are in powder form and must be ground, mixed, tested and cleared out of the equipment in minimum time consistent with quality, while other products are pastes and must be checked for many physical characteristics in addition to the tests for shade, strength, brightness and dyeing properties, which are involved for all dyestuffs.

All dyes are produced in batch operations, the size of the batch depending upon such factors as sales requirements, process requirements, and previous experience in making the dye. Powder products are accumulated after testing until an economic mixing quantity of good material is available. This is then ground in appropriate equipment and loaded into a mixer of a size suited to the quantity of dye being mixed. A mix may be 20,000 lbs or more, or as little as 2,000 lbs or less, the capacity of a given mixer depending upon the density of the product. The efficiency of the mixing equipment having been determined by previous check tests, the mix is run for the proper time and sampled. Tests are conducted, upon the results of which additions are calculated and made to the mixer, and mixing continued. This process of mixing and testing is repeated until the tests show that the contents of the mixer equal the standard. The dye is then dumped into shipping containers, again sampled and tested, and if still equal to standard, released for shipment. A reference sample is filed, and every standardizer's hope is that it will never be needed.

Paste products are similarly produced in batches, tested, mixed in appropriate equipment, and standardized and packed.

Many tests must be conducted to control application and physical characteristics. These steps may require only one day in the case of dyes easy to standardize, usually take two to five days, and may in a few cases be prolonged as much as two weeks. Standardizing is a production job in more ways than one. This department characteristically produces tests in the same way a plant produces products. The program must be so organized as to get out the maximum number of dependable tests in the shortest possible time. With many mixers all being controlled at the same time, this involves scheduling and working with an eye on the clock.

Standardizing in most dye manufacturing plants is still based largely upon miniature dye trials and other tests which

* Presented in Boston, Mass, before the Northern New England Section on December 1, 1950.

simulate on a small scale the factors involved in the use of the product on a mill scale. For a dye generally used in the dyeing of wool, for example, dye trials are made on wool yarn, during which the following points are checked: solubility and ease of solution, dyeing rate, shade, strength, brightness, and behavior on other fibers. These dye trials are made on each batch as soon as it is finished so that these characteristics may be known before it is mixed with other batches. Any abnormalities found will alert the plant chemists to prevent any more substandard production.

In the standardization process the only adjustment sometimes necessary is that of strength as shown by the dye trial on the mixer sample. Since standards are so set up that normal production will be somewhat stronger than standard, or at any rate not weaker, adjustment consists of adding a calculated amount of the appropriate diluent. Another dye trial on the mixer sample checks the accuracy of the first determination, and the mixer is dumped into shipping containers. Since all of the available material is usually in the mixer, standard must be approached from one side and not be passed, or overstandardized. If weak material is thus made by carelessness or accident, it must ordinarily be dumped out of the equipment, held until stronger crude is again available, and then reloaded for correction. This procedure is expensive as extra handling doubles mixer losses, besides involving more labor. In addition, the longer time required may delay deliveries.

Diluents vary with different dyes. Unless there are reasons why it should not be used, common salt is preferred as it may be obtained of good quality at a reasonable price. Although much work has indicated that common salt may safely be used in standardizing wool dyes, most manufacturers use anhydrous sodium sulfate for those products. Where neither of these diluents may be used because of unfavorable effect on solubility or other application properties, dextrine, sugar, urea or other organic materials may be used.

Frequently in the complex synthetic processes involved in making many intermediates and dyes, production does not run so uniform that standardizing involves only adjustment of strength. Shading must often be done to correct any difference of production from standard. This consists of the addition of small amounts of a related color that will correct the shade difference. In general the amount will be less than one per cent, in some instances a little more. The use of more than a per cent or so of shading dye would be considered color mixing rather than shading.

While shading takes care of small variations in shade, differences in brightness are not so simply adjusted. Present-day standards are set up on a high level of brightness, and substandard production is usually dull. The only known correction for dullness is the production of sufficient superquality to enable the blending off of small amounts of substandard material. Unfortunately, at times superproduction is not available, and, after a long wait for the impossible, it may become necessary to throw the poor product away. Good standardizing aims at stopping production rather than permitting the accumulation of poor product, which cannot be put into liquid stock.

The foregoing is a simplified version of the factors surrounding the standardization of a simple acid dyeing color. Methods are based upon current mill practices in the use of the dye in question. Any complaints that may come in are likely to influence future standardization of the product in complaint. Even though the dissatisfaction may be based upon unusual uses, the goal is the delivery of products that behave like previous deliveries wherever they may be used.

Chrome colors are usually checked by more than one method of application if they are suitable for such uses. The growing use of synthetic fibers imposes an additional strain on standardizing. A color that meets standard when dyed on wool, may not, when used on nylon, for example.

The many classes of dyes must be handled similarly, and each class presents its own problems. Basic colors are no longer used to any great extent on textiles, but are widely used for the coloring of paper, leather, pigments, carbon paper and typewriter ribbons. Suitable tests must be devised to simulate on a small scale the practical conditions imposed upon these products in these many diverse uses. Some acid dyes, for example, are of little interest to the woolen industry but are used in large quantities on paper or as pigments. While wool tests may be made as a matter of check, the principal tests must be made on paper or to form pigments before such acid dyes may be sent to those trades, respectively.

Direct dyes, aftertreated direct dyes, developed dyes, naphthol dyes, and vat dyes must all be controlled carefully. Many special tests have been devised to cover important application properties, including pH determinations, special solubility and filtration tests to cover package-machine applications.

The usual dye trials and other objective tests suffer somewhat from lack of extreme accuracy. They have the big advantage of evaluating products under conditions similar to those prevailing in large-scale use, thus revealing behavior differences which would often not be detected by measuring physical or chemical constants. In addition, results are very easily interpreted by those with the necessary experience. They have several disadvantages. They are subject to relatively violent variations, particularly if careless technique develops. Repetitive tests are therefore necessary if there is to be real assurance. At best the whole process of making the dyeings and of judging them is never presented to be as accurate as it should be in view of the value of the products. Nobody seriously claims greater accuracy than $\pm 2\%$.

There has been a continual search for greater precision, particularly by those who cannot tolerate the possibility of such variations even though the techniques with greater potential accuracy may not achieve it in practice. The chemist's analytical methods, for example, are set up on a basis of reproducibility which is very impressive. Actual practical analyses, however, do not always justify such claims.

So in the field of standardizing we have had colorimeters, spectrophotometers, chemical methods of assaying dye content, and trick application methods, which are supposed to eliminate at least some of the variables. We have used them all and still use some of them. Most recently the spectrophotometer is in the ascendency, and many of its adherents recommend scrapping all other tests and depending entirely on instrumental results. They are only outdone in their positive approach by the adherents of the Color Eye and those of the Hunter Color-Difference Meter.

It is well known that some of these instruments measure only the relative amounts of color in solution with no assurance that the color is dye and capable of being effectively used in the dyeing process. Others require that a dyeing be made, thus involving the recognized potential inaccuracies of the dye test but largely eliminating personality factors presumably associated with visual judgment. In all of them results are or can be expressed in numbers, which possess much more appeal to many technically minded people than the relative terms used by so-called expert visual judgers. The words "trace," "noticeably," "much" (especially since these terms do not always mean the same degree of difference) do not connote real accuracy, whereas numbers are practically worshipped in some quarters.

Since neither of the two schools of

thought have made too much effort to appreciate the point of view of the other, there is at the present time a sort of mutual stand-off attitude, mutual distrust and suspicion. Much may be and has been said on each side, and as is often the case in such situations, much might better not have been said. Therefore, without attempting to develop the details of each side, this observer states a personal opinion that the argument is best resolved by adopting the best of each system. Accordingly, we adhere to the small-scale dye trial to cover all application factors and to resolve major differences in results if they occur, and concurrently run instrumental tests to refine the accuracy. In cases where the combined testing programs are used, we feel that we can proudly claim a practical realization of the ±2% goal, thus assuring the least possible variation in shipments and also saving much time in the process of standardization. The exercise of good judgment is more productive than rigid adherence to one or the other of the two systems of evaluation.

A standardizer is the well-known middleman exposed to definite lines of force exerting pressure from several sides. The plant man is certain he is too mindful of the possibility of complaints from the trade and therefore gives away part of the yield or some of the hard-won brightness. The standardizer knows, however, that he cannot thus keep out of trouble with the customer, as strong or bright material throws off the shade in the dyeing process just as much as do weaker or duller shipments. Generally the salesman likewise is critical of the standardizer, as any complaint is distasteful regardless of whether it is justified or not. And, if there are no complaints, standardizing is likely to be blamed for delaying deliveries because of holding the dye for further tests when it is probably more accurately standardized than it needs to be.

There is no uniformity of procedure among the many users of dyes. Since it is practicable to run only typical tests, there is always the danger that some dyes are used under conditions that are not typical and that this is not recognized until difficulty develops. As a matter of real fact, these pressures are merely what should be expected in a liquid situation. The plant man is constantly seeking improvements in processing and in costs, and hopes to achieve them without sacrifice of quality. The consuming trades, being highly competitive, are likewise seeking to lower their costs and to shorten their processes. They are moving at a pace which does not permit of as many controls as of necessity must be part of the dye manufacturing processes.

Percentagewise, experience of consumers with present-day standardization must be generally favorable according to the level of complaints. The development and use of special tests have undoubtedly eliminated the causes of many complaints previously made by the trade. For example, the relative behavior of two deliveries when dyed at 150° F may be quite different from their behavior when dyed at or near the boil. Variations in solubility may not be significant in many mill applications but may be objectionable in those uses that require high solubility approaching the attainable limit. Similarly, the staining of an effect thread is only of concern to the dyer of material containing that particular effect thread. The dyeing of cellophane involves conditions quite different from those imposed upon the same dyes in the regular processes of dyeing cotton or rayon.

Technological development all along the line has resulted in many improvements in dyes. It is no longer possible to adhere indefinitely to inviolable standards. In modern times standards have not been static. They have been definite yardsticks merely for periods of relatively few years. Changes demanded by the consuming trades have necessitated the establishment of new standards, more so in the cases of some products than others. To improve the solubility of a dye it may be necessary to change the shade slightly. Similarly, to improve dischargeability may make it necessary to accept some little shift in shade or brightness. Many of the variations thus caused by trade requirements are of low order of significance, so that new standards may be set up without inconveniencing users of the products. This makes it possible to restrict the number of standards and manufacturing processes with advantages in inventory control and availability of shipping stocks. But this tendency to establish progressively higher standards of products increases the need for emphasis on careful control tests in manufacturing and standardizing dyes.

The development of improved shipping containers removed the cause of many complaints from the consuming trades. The old wooden containers were physically undependable and permitted the absorption of moisture by powder products and the loss of moisture by pastes. These weaknesses of wooden drums lead to much dissatisfaction. The modern hermetically sealed package and the development of special linings have eliminated most of the problems of this sort. Many consumers now have no incentive to check incoming shipments of dyes and expect the standardizers to assure uniform deliveries, a responsibility which is seriously discharged. Those customers who do check deliveries are rather generally impressed by the results of their tests.

This rather brief presentation of the work of the standardizer has disregarded many details, some of which are generally understood by users of dyes. It is hoped that we have touched various aspects of standardization sufficiently, however, to stimulate questions which will develop additional points of interest.

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Program, Mid - West Section Outing

THE following program has been arranged for the Mid-West Section's Annual Outing to be held at Lake Lawn Lodge, Delavan, Wisconsin, on June 16:

8:30 a.m.—Registration in hotel lobby.

9:00 a.m.—Softball game (Millmen vs. Salesmen).

11.30 a.m.—Buffet luncheon.

12:00 noon—Golf tournament.

1:30 p.m.—Horeshoes, ping-pong, canasta tournaments.

7:00 p.m.—Dinner.

As a special attraction, a short demonstration of golfing skill will be given by Marvin Stahl at 11:00.

The committee is headed by George Chabot, Chairman, and includes F Acker, A F Blackburn, K P Ferguson, W H Jaeger, H F McKenna J Morgan, W D Paine, C H Sillin and J G Stott.

EMPLOYMENT REGISTER

This column is open for two insertions per year, per member, without charge. Blanks can be obtained from, and filed with, the Secretary of the Association, Lowell Textile Institute, Lowell, Mass. It is understood that these will be open to inspection by prospective employers who can obtain further information from the Secretary.

51-6

Education: S B, Massachusetts Institute of Technology.

Experience: Laboratory, textile chemistry, microbiology, bacteriology, manufacturing quality control and development.

Age: 58; married, references; location in New England desired.

5-28, 6-11

51-7

Education: M A, textiles, clothing, business administration & marketing.

Experience: teacher and research assistant.

Age: 34; woman; single; executive or research position desired, location immaterial.

5-28, 6-11

DEVELOPMENT OF THE LIGHT-FASTNESS STANDARDS OF THE SOCIETY OF DYERS AND COLOURISTS*

FASTNESS TESTS CO-ORDINATING COMMITTEE

DURING the course of the last few years there have appeared in the Continental press a number of statements, which indicate that the facts relating to the development of light standards in Great Britain are not fully known. The general tenor of these statements is indicated by the following extracts:

(i) . . . the German standards with two unimportant exceptions are used in England today (P Rabe *(1)*).

(ii) . . . England have in essentials adopted the blue scale on wool worked out by the old D E K, with certain minor modifications (W Weltzien *(2)*).

(iii) The blue standards established by the D E K in 1936 for the assessment of light fastness have now been reproduced in England . . . (C Zuber *(3)*).

(iv) . . . the eight-step blue scale on wool, which was first published in the seventh edition of the D E K test methods in 1935 (H Ris *(4)*).

The Fastness Tests Co-ordinating Committee would therefore like to draw attention to the history of the development of these standards in Great Britain.

The work carried out by the Society on fastness tests was started in 1928, when a small number of investigators were appointed and arrangements were made for practical work to be carried out in the laboratories of the British Research Association for the Woolen and Worsted Industries (now the Wool Industries Research Association). An announcement to this effect was made in July, 1928 *(5)*.

By July, 1929, it was possible to report *(6)* on the results of a large number of fading tests which had been carried out on fabrics composed of different fibers and in different parts of the world. The influence of humidity on the degree of fading had been investigated in the laboratory and was discussed in some detail in this paper. It was stated that an extensive examination of the existing German light fastness standards on wool, cotton, and silk was being undertaken.

In an article in 1930 (7), Dr P Krais, then Director of the German Textile Research Institute in Dresden, discussed various aspects of fading. After referring to the differences between the results obtained with fading lamps and sunlight, the author proceeded to discuss "the practical method," by which he referred to the use of dyed standards.

At this time the Deutsche Echtheitskommission (D E K) had separate light fastness standards for each of the following fibers: *(a)* cotton, *(b)* wool, *(c)* unweighted silk, *(d)* weighted silk, *(e)* acetate, and *(f)* viscose, i e, 48 separate dyeings were used. Moreover, with any one fiber the eight standards were dyed in different colors; for example, the wool standards comprised red, green, blue, and violet dyeings.

The remarks of the author of this paper (Dr Krais) make interesting reading—

> "A second point of doubt is the choice of standard dyeings the German Commission (D E K) has come to. I am sure the English and American Commissions think to be able to improve on this. No doubt they will be able to do so, but what will it avail? These standards are chosen with the utmost consideration and on the basis of many years' experience. And with these very standards we have now had sixteen years' experience on the top of that, in any way with those on cotton and wool, and we are quite satisfied with them as a working set, though they might not fulfill every ideal. . . . Not a single discrepancy has crept up through all these years, though these standards are recognized by the Patent Office. . . . The firms of the IG are using these standards now regularly. Would it, therefore, not be the best way, the simplest and quickest, if the commissions of the other countries would adopt them en bloc, as far as practical testing is concerned? . . ."

On the 7th of April 1930, Dr P Krais met the Executive Committee of the Fastness Tests Committee and members of the British Research Association for the Woolen and Worsted Industries in Leeds to discuss international co-operation in fastness work *(8)*. He repeated the suggestion that the Society should accept the German standards as a whole, any alterations which might subsequently be found necessary being made by agreement.

The British Committee pointed out, however, that the German standards had been thoroughly examined by its research workers and had been found to have many defects and inconsistencies, details of which were given. The Committee was therefore unable to accept the German standards and intended to continue its investigations.

The Committee informed Dr Krais, moreover, that, as a result of its work on this subject extending over two years, it had been found unnecessary to have standards for each test on separate fibers. In view of this it was intended to establish general standards on one fiber only. Dr Krais said he would put before the German Committee the criticisms which had been made on the existing German standards and the suggestion that standards should be on one fiber only.

In a paper published in the *Journal (9)* during the same month as this meeting, it was stated that the considerable amount of data which had been obtained on fading led to the conclusion that the fading of dyeings on wool and silk was less affected by humidity than was the fading of dyeings on other fibers. The influence of humidity and of sulfur dioxide on 67 dyeings on different fibers was given in detail.

An "Interim Report October 1930" on the work carried out under the Society's

* Simultaneous publication of this communication from the General Secretary of the Society is taking place in the *Journal of the Society of Dyers and Colourists* (English), in *Teintex* (French), in *Melliand Textilberichte* (German) and in *Textil-Rundshau* (Swiss).

TABLE I

Standard	German	British
1	0.6% Brilliant Wool Blue FFR extra	No standard
2	0.6% Wool Blue N extra	0.5% Lissamine Violet 6BNS
3	1.0% Brilliant Indocyanine 6B	0.6% Brilliant Indocyanine 6B
4	1.5% Wool Fast Blue GL	1.1% Polar Blue G conc
5	1.3% Cyananthrol RX	0.5% Solway Blue RS (≡ Cyananthrol RX)
6	2.5% Alizarine Direct Blue AGG	2.0% Alizarine Light Blue 4GL
7	2.5% Indigosol AZG	4.0% Caledon Blue GCP 300 powder
8	3.0% Indigosol Blue AGG	3.0% Indigosol Blue AGG

fastness scheme was published in the *Journal (10)* in January, 1931, describing briefly the results of the many exposures carried out in 1928-1930; again in a discussion of the influence of humidity, it was stated—

> The work of 1928 and 1929 having shown that silk and wool are the best fibers to use for standard dyeings, the choice has fallen on wool, since silk has several disadvantages.

At this time it was intended to establish a range of light fastness standards in each of the colors red, green, and blue, on wool cloth, and a list was given of those dyes which had been found suitable for this purpose after considerable experimentation.

During the summers of 1931 and 1932 the gaps in the range of blue and red standards were filled, but the green range was abandoned. Because of the approaching Jubilee of the Society, publication was delayed until 1934, when the "Report of the Society of Dyers & Colourists on the work of its Fastness Committee in fixing Standards for Light, Perspiration and Washing" was published. It may be noted that, in referring to the Interim Report of October, 1930, with regard to the elimination of all fibers but wool, this report commented as follows—

> "It is a significant fact that the proposals made at the time (i e, 1930) by the Society's Fastness Committee have been subsequently used by prominent German and American organizations interested in the subject."

In 1932 there appeared a communication *(11)* from the laboratories of the I G Farbenindustrie A-G in which there were described the results of a large number of light exposures in eighteen different countries. It was stated that from these exposures they had selected a series of blue dyeings on wool which were to serve as the standards for all fibers. These standards were also given by the D E K in the 6th edition of the "Verfahren, Normen und Typen" in 1932. It is clear, therefore, that the German and British standards were worked out simultaneously.

The standards as originally issued by the two committees were as in Table I. Although there were differences in concentration, the similarity of the dyes chosen was quite remarkable.

During 1937-1939 a comparison was made of the light standards proposed by the German, American, and British committees. After protracted correspondence and meetings the three committees were almost agreed on a common set of standards. This was achieved largely through the fact that the American and British committees were prepared to give way on several standards in the general interest, although they were of opinion that there own standards were as good as those insisted upon by the D E K.

During the Spring of 1939 the negotiations had reached the stage when it had been agreed that an announcement would be made simultaneously in the three countries. In May, 1939, however, Dr Krais wrote a letter in identical terms to the American and British committees, making the following uncompromising statements—

(i) The scale of light standards was first worked out by the I G, had been published in 1936, and was still in use.

(ii) The 8th edition of "Verfahren, Normen und Typen" was being prepared and would contain their original standards.

The D E K also raised objections to the proposals for distributing the standards in America and Great Britain. The 8th edition of the tests was published shortly afterwards.

During July, 1939, further correspondence took place and Dr Krais submitted a draft announcement for publication. This contained statements which purported to give a history of the standards, but which were regarded by the Society as a claim that the establishment of the standards was due almost entirely to the I G. Neither the Society nor the American Association of Textile Chemists and Colorists was able to accept this view, and they had reluctantly to conclude that agreement on a basis of equal partnership with the D E K was not desired by the I G. In September, World War II broke out.

The original S D C standards had been devised on the basis of medium depths, since these would introduce the least difficulty in comparing samples of any depth. During the 1937-1939 discussions, the standards were increased in depth in order to come into line with the D E K. On the failure of the discussions the Society retained the deeper dyeings in general, and in 1940 issued a revised set of standards *(12)*, which in 1942 were adopted as national standards by the British Standards Institution *(13)*.

The 1939 standards of the D E K and the 1940 standards of the Society were as in Table II.

The British Committee is at present engaged on further minor revisions of the light standards, in particular standards 6 and 7.

TABLE II

Standard	1939 German	1940 British
1	0.8% Brilliant Wool Blue FFR extra	0.8% Brilliant Wool Blue FFR extra
2	1.0% Brilliant Wool Blue FFB extra	1.0% Brilliant Wool Blue FFB extra
3	1.2% Brilliant Indocyanine 6B	1.2% Brilliant Indocyanine 6B
4	1.2% Supramine Blue EG	1.1% Polar Blue G conc
5	1.0% Cyananthrol RX	0.8% Solway Blue RS (≡ Cyananthrol RX)
6	3.0% Alizarine Light Blue 4GL	2.5% Alizarine Light Blue 4GL
7	3.0% Indigosol 06B	2.5% Soledon Blue 4BC powder
8	3.0% Indigosol Blue AGG	3.0% Indigosol Blue AGG

REFERENCES

(1) P Rabe, *Melliand Textilber* 30, 470 (1949).
(2) W Weltzien, *ibid* 31, 634 (1950).
(3) Z Zuber, *Teintex* 15, 9 (1950); *Textil-Rund* 5, 15, 41 (1950).
(4) H Ris, "Short Historical Review of the Position of Fastness Testing" (paper presented at a meeting in Basle, February 1951, called by the Swiss, French and German Fastness Committees).
(5) *J Soc Dyers Colourists* 44, 208 (1928).
(6) *Ibid* 45, 214 (1929).
(7) P Krais, *Am Dyestuff Reptr* 19, 33 (1930).
(8) *J Soc Dyers Colourists* 46, 165 (1930).
(9) P W Cunliffe, *ibid* 46, 108 (1930).
(10) Idem, *ibid* 47, 7 (1931).
(11) *Melliand Textilber* 13, 539 (1932).
(12) *J Soc Dyers Colourists* 56, 273 (1940).
(13) B S 1006: (1942) (obtainable from the British Standards Institution, 28 Victoria Street, London, S W 1, England).

ONE HUNDRED AND SEVENTY-SIXTH COUNCIL MEETING

THE Council held its 176th meeting at the School of Textiles, North Carolina State College, Raleigh, N C, on Friday morning, April 20, 1951. Present were President C Norris Rabold, *presiding;* J Robert Bonnar and George O Linberg, vice presidents; William D Appel, Carl Z Draves, Thomas R Smith and P J Wood, Past Presidents; Leonard S Little, chairman of the Research Committee; Edward B Bell, Ernest R Kaswell and Harold W Leitch representing Northern New England; Raymond W Jacoby, Alden D Nute and James A Stevenson representing Rhode Island; Charles W Dorn, Herman E Hager, William A Holst, Norman A Johnson, Patrick J Kennedy and Henry L Young representing New York; George H Schuler, Richard B Stehle, Percival Theel, Frederick V Traut, S Graeme Turnbull, Jr, and Jackson A Woodruff representing Philadelphia; John B Neely, Linton C Reynolds, Henry A Rutherford and Sumner H Williams representing Piedmont; Glenn R Bellamy representing South Central; A Kempton Haynes and C Russell Gill representing Southeast; Joseph H Jones representing Mid-West; Kenneth H Barnard of the Convention Committee; Glenn D Jackson, Jr of the Publicity Committee; Harold W Stiegler, Research Director; W L Barker, M E Campbell, W F Fancourt, 3rd, G H Hotte, H J Jordan, Jr, R G Lawrence, W F Luther, J C Robertson, H G Scull, H G Smith, A F Tesi, A R Thompson and H C Chapin, *secretary*. Malcolm E Campbell, Dean of the School of Textiles opened the meeting with greetings from North Carolina State College.

The Secretary's report of the 175th Council meeting was approved, with addition, among those present, of W R Moorhouse to the report as written, and of G H Schuler and A E Sampson to what was printed. The Secretary's financial report of April 2, and the Treasurer's report of April 4, were accepted.

The Bylaw amendment defining Regions for election of Vice Presidents was reported adopted by letter ballot. The proposed rewording of Article IV, Section 10, regarding the Convention Committee, was tabled on motion of Mr Barnard, pending further recommendations from his committee and that on Constitution and Bylaws.

For the Publications Committee Professor Theel reported progress on the Year Book of 1951. The pamphlet on dyehouse mathematics was almost ready for publication. The bulletin on apparatus and materials used in tests of the Association had been published in pamphlet form and was available from the Secretary. For the Vat Dye monograph, July first had been set as the final date for receipt of corrected copy by the editor. The chapters would then be put in form consistent with one another and sent to the printer. The members of the committee to select papers eligible for the American Dyestuff Reporter award would be Hugh Christison, Harold M Chase and Professor Ethel L Phelps. For the Colour Index Committee Mr Jacoby reported the contract nearly completed.

Mr Little reported plans of the Executive Committee on Research for a budget, in the year beginning August first, nearly fifty percent larger than the budget for the current year, including provision for an Assistant Director of Research. A new committee on dry-cleaning had been organized.

Mr Appel described plans of the delegation from this country to the International Standards Organization meeting in England this June, to which Mr Little had been appointed representative of the Association, and to which Mr Rabold also was appointed at this meeting.

Mr Dorn discussed the convention of the Association to be held in New York on Wednesday, Thursday and Friday, October 17 to 19, 1951. On the Technical Program, Mr Holst said that an Industry Symposium would replace the usual General Technical Session. Papers from textile mills were particularly desired. Mr Young reported arrangements for 125 booths in the exhibit. For the ladies, Mr Hager said theatre parties were being planned. Mr Kennedy said no student contest could be arranged this year, but the winner of the contest between the Southern Chapters on April 21 would be invited to the convention with expenses paid. Kenneth A Howry had been made a member of the Intersectional Contest Committee.

Relative to the Boston convention in 1952, Mr Linberg stated that Dr Walter J Hamburger would serve as his Vice Chairman. Mr Jones claimed for the Mid-West Section the option of managing the Chicago convention of 1953, as voted by the Council last June. An invitation brought by Mr Gill from the three Southern Sections, to hold the convention of 1954 in Atlanta, was accepted with approval of the Convention Committee.

The date of the next Council meeting, in the New Yorker, was changed to June 26. For meetings in 1952, in New York, the dates January 18, April 18, June 20, and September 19 were recommended by Mr Joerger's committee and adopted. Each of these is the third Friday of a month, in accordance with custom established this year. The last meeting of the year will be on Thursday, November 6, in connection with the Boston convention.

Mr Linberg reported for the committees on Corporate Membership, and Membership and Local Sections. A Student Chapter at Fairleigh Dickinson College was authorized. A committee consisting of the Vice Presidents, Secretary, Linton C Reynolds and Percival Theel was appointed to recommend definition of the "five years experience" required for Senior membership, with particular reference to the rating of education.

Elected to Corporate membership were Blackman-Uhler Company, Goodall-Sanford, Inc, and Rock River Woolen Mills. Each of the following was elected to the class of membership specified, as of thirty days from publication of application, provided no objection be received meanwhile by the Secretary.

Senior

H E Abbott
J Aleska
C W Angline
G B Angus
I Barnett
A F Beane
H H Behrens
A T Bessette
H E Braun
I M Buchholtz
H B Caulfield
B Chudzik
B R Cohn
D Cohn
F Conrey
A M Cooke
A J Dahlke
H P Daignault
P D'Amour
A W Dehle
W Dettwyler
G H Detwiler
F J Devinney
E Ehas, Jr
H A Ehrman
T E English
C W Evans
W J Ferracone
T G Finzel
A Fischer
B J Fitzgerald
R A Fliegel

H B Freyermuth
J N Gammon
H T Gerundo
R Gongoleski
E Greif
E J Gsell
C A Gunther
C F Gurnham
E Haller
L F Hance
T E Hastings
T E Headrick
F C Heller
E P Henley
A E Hooper, Jr
W P Hope
J C Horai, Jr
G Illovsky
H J Kelly
R O Kettner
A J Kivelson
F A Kutaydin
H Lauber
B J Lisowski
A H Lowe
C C MacNeill
G L Marshall
V Martinez T
E F Maybert
E H McCoy
L W Meyer
J P Miller, III
G S Mobley
R P Monsaert, Jr
H I Mueller
G C Norris
M Olivo
M L Pandya
W H Paul
M Pettit
N Pezza
J J Quinn
J M Quinn
E Ramsli
B F Rivers
G T Roberts
H Ruegg
F H Salling
D A Sawyer
W K Sawyer
R J Schadewald
H J Schlosser
E C Schloth
G Schmalz
H F Schoellhorn
A Sharphouse
A Shepherd
M Slone
A R Smith
W S Sollenberger
H G Sommar
W H Spuhler
F A Stetkiewicz
I Teplitz
C E Varn
J E Vaughn
G E Wallace
J E Wasko
H H Webber
A X Wisowaty
C S Wood
C C Yeager
J E Yount

Junior

I J Bannister
T M Baxter, Jr
V J Brock
R L Burgess
W J Cooney
H B Crapps
T A Gobatto
W B Goodwin
W B Guerrant
J M Hamilton
M A Harrington
R G Harris
W F Hess, Jr
C B Hilton
T Jannink
G C Kantner
H E Keene, Jr
R T King, Jr
A G Kneeland
H S LeMay
C A Lermond
R E Mackey
A Mafilios
F R Maia
D E Martin
W R Mikulik
T C Neal, Jr
W H Neff, Jr
E F Pierce, Jr
C R Pinucci
E F Richardson
T M Rose
A C Scache
A Schiff
K E Schmalenberger
H S Sevin
R J Stevens
E P Stoetzner
A D Whitfield
N D Wonch

Associate

S A Ahmad
C A Baker
J Bartok
M W Fletcher
C H Garren
H A Horstmann
C Jones
J H Jones
F K Jovin
H W Kendall
Y Maruta
C H McKaig
B M Montgomery
A S Price
W M Redmond
M O Reiche
T L Scala
L L Shailer, Jr
C O Starnes
F H Tamm
D F Welch
R A Ziemer

Student

B M Akhtar
L Barish
C D Bostedo
A W Caezza
F J Carolan
H J Cieply
J J Clarke
C W Cox
A A Curtis
L DeGasperis
R A Diekman
P W Dulken
J F Florentino
D M Freedman
G W Gannon
J C Gargash
D A Griffith
J Kelleher
J W King
L L Kornfeld
J M Kuschawara
J L R Landry, Jr
L G Lanier, Jr
A B E Lauman
K M Lobb
J J Mastracco
G L McRee
R L Moore, Jr
R T Muhler
D B Mulvey
J E Murphy
B E Normandin
J C Notaro
G F Nurnberger
R J Olson
R A Pearson
J M Polito
B L Powers
R J Rotsaert
D J Schaaf
M M Shah
R G Simone
E Suozzo
H M Szczepanik
N R Thompson
T F Walsh
S T Wright
R S Zecker

Transferred from other classifications to Senior membership were:

J F Cairns
C DeSoto
J L Fancourt
M L Fillippeli, Jr
W D Livingston
D Fornelli
T J Gillick, Jr
B W Hayward
J F Leonard

Respectfully submitted,
H C CHAPIN
Secretary

Rhode Island Section Meeting Report

April 27, 1951
Wannamoisett Country Club, Rumford, R I

THE Rhode Island Section met at the Wannamoisett Country Club, Rumford, R I, on Friday evening, April 27, 1951, with attendance of about 225. The speakers were J Whitney MacDonald, General Manager of the Rumford Chemical Works, whose subject was "The Need for Labor Management Cooperation in the Plant and in the Community"; and George H Arris, Financial Editor of the Providence Journal and The Evening Bulletin, who spoke on "The Economic Future of Textiles in New England."

Respectfully submitted,
R G THOMAS, *Secretary*

Pacific Southwest Section Meeting Report

April 27, 1951
Los Angeles Athletic Club, Los Angeles, Cal

A meeting of the Pacific Southwest Section followed dinner at the Los Angeles Athletic Club on April 27, 1951. In a program arranged by Dr B M Brundage of the Atomic Energy Commission, Clayton Douglas of the University of California at Los Angeles showed a film, "Operation Crossroads", illustrating the effects of atomic bombing in the Pacific. This was followed by discussion and demonstration of devices for measuring atomic radiation.

Officers were elected as follows—
Chairman—Robert Mishell
Vice Chairman—Adolph B Stonstrom
Secretary—June Ericson
Treasurer—Joseph M De La Barre

Respectfully submitted,
DAVID F DRISCOLL,
Secretary

SECRETARY'S FINANCIAL REPORT — APRIL 2, 1951

	Applications	*Dues, Regular & Reinstate*	*Dues, Corporate & Sustaining*	*Miscellaneous*	*Totals*
Received and transmitted to Treasurer					
Aug 1, 1950 to Jan 10, 1951	$2,296.00	$31,994.00	$33,172.50	$11,136.80	$ 78,599.30
Jan 10 to Apr 2 1951	1,126.00	8,316.00	11,562.50	3,301.26*	24,305.76
Totals in fiscal year to Apr 2	3,422.00	40,310.00	44,735.00	14,438.06	102,905.06
Leaving deposited by Treasurer with Secretary					4,602.05
Miscellaneous items*					
Dividends and interest					382.90
Launder-Ometer royalties					160.00
Reporters and reprints					60.75
Year Books					478.13
Crockmeters					507.33
Crock cloth					538.50
Moth cloth					204.00
Water test apparatus					144.75
Dyed standards					52.00
Knitted tubing					16.40
Gas fading units					2.00
Flammability apparatus					3.00
Analytical Methods					624.00
Color transfer charts					127.50
					$3,301.26

Rabold, Little and Appel Represent U S at IOS Meetings

C Norris Rabold, Leonard S Little and William D Appel, three members of Technical Committee No 38 of the American Standards Association, left for Europe on May 18 to represent the United States at the International Organization for Standardization Conference, which was held June 3-9 in Bournemouth, England.

In addition, Mr Rabold represented the AATCC, his company, (Erwin Mills, Inc) and the Southern Textile Association at the Textile Institute Conference, which was held at Brighton, England, May 20-26.

While in England, Mr Rabold was slated to visit Imperial Chemical Industries Limited in Manchester. Following this, his itinerary called for visits to dyeing and finishing plants, dye companies and dye manufacturers on the Continent, where he was to attend meetings and address various textile organizations. In addition to guest appearances at the Institute Textile de France in Paris and the Swiss Federal Institute of Technology in Zurich, Mr Rabold was scheduled to present data and take an active part in a meeting of the Swiss Colorfastness Committee. He will return to the United States on or about June 25.

New York Section '51-'52 Meeting Dates Announced

THE Program Committee of the New York Section, has disclosed the following meeting dates for the 1951-1952 season:

September 28, Swiss Chalet, Rochelle Park, N J.

November 30, Swiss Chalet.

January 11, Hotel New Yorker, New York, N Y.

February 29, Hotel McAlpin, New York, N Y.

April 11, Swiss Chalet.

May 16, Swiss Chalet.

June 20, Outing (Site to be determined).

Report of New York Section Meeting

A meeting of the New York Section was held on Friday evening, May 17th, 1951 at Kohler's Swiss Chalet, Rochelle Park, New Jersey. An informal dinner preceded the meeting.

The Chairman, Paul J Luck, reported that the attendance (approximately 375) was the largest for any May meeting of the Section. He also announced that Fairleigh-Dickinson College was now represented by a Student Chapter of the Association. The Chairman introduced Samuel L Hayes, a Past Chairman of the New York Section, who has the unique distinction of also having served as Chairman of the Piedmont Section. Also introduced were Henry F Herrmann, a Past President of the Association, and J L Morrison, President of Morrison Machine Company.

During the annual business meeting reports were given by James J Marshall, Treasurer, Norman A Johnson, Secretary, Ernest Gsell, Chairman of the Outing Committee, and Patrick J Kennedy, Chairman of the Nominating Committee. In accordance with the slate presented by the Nominating Committee, all officers were reelected.

Sumner H Williams, Southern Manager, General Dyestuff Corporation, presented a paper on dyeing by the hot oil process. This was followed by considerable discussion. A number of dyed fabrics were on display.

Respectfully submitted,
NORMAN A JOHNSON,
Secretary

Mid-West Section Meeting Report

Hotel Schroeder, Milwaukee, Wisconsin
May 5, 1951

THE afternoon technical meeting, which was called to order at 2:15 by the vice-chairman, was attended by approximately 100 members and guests. Following a few announcements by the Chairman, the vice-chairman introduced the speaker for the afternoon, J M Schandler, of the Philadelphia office of the Rohm and Haas Company, whose subject was "Color Stripping with Reducing Agents". The afternoon meeting was adjourned at 3:00.

Dinner was served at 7:30 pm to 80 members and guests and the evening meeting called to order at 8:30 by the chairman. The secretary's minutes and the treasurer's reports were read and approved. Joseph H Jones then reported on the recent council meeting that he he attended, following which Eric W Camp reported on the work which he has done in connection with the 1953 Annual Convention to be held in Chicago. Mr Camp named the following committee chairmen to assist him in planning and running the 1953 convention:

J H Jones, *Sub-chairman*
F F Myers, *Dining and Banquet*
G B Chabot, Jr, *Entertainment*
F E Hilger, *Exhibits*
H T Latham, *Ladies*
J G Stott, *Printing*
W Boyd, Jr, *Publicity*
M H Boyce, *Registration and Reception*
S Klein, *Reservations*
E Morrill, *Technical*
L B MacFarland, *Transportation*

These committee chairman will select their own committees at a later date. A report on the Corporate Membership Committee was given by F E Hilger, the Committee chairman, and G Chabot reported on the plans which his committee had made for this year's outing.

Following the reports, the subject of meeting sites was brought up by the chairman, who gave a report explaining why the Executive Committee had decided to hold the recent Chicago meetings at the Morrison Hotel rather than the Bismarck Hotel. After some discussion on the subject, a motion was made by C Wille, seconded, and carried that the selection of meeting sites be left in the hands of the Executive Committee. The Nominating Committee for 1951 was named as follows:

S Klein, *Chairman*
E W Camp
M H Boyce
A I Hultberg
V H Lawrence
L B MacFarland

Following this, the chairman turned the meeting over to S Klein, manager of the Chicago office of the Calco Chemical Division, American Cyanamid Company. Mr Klein introduced the evening speaker, S Luscian, Calco Chemical Division, Bound Brook, N J, who spoke on the subject "Modern Use of Vat Dyes in the Textile Industry."

The meeting was adjourned at 10:00.

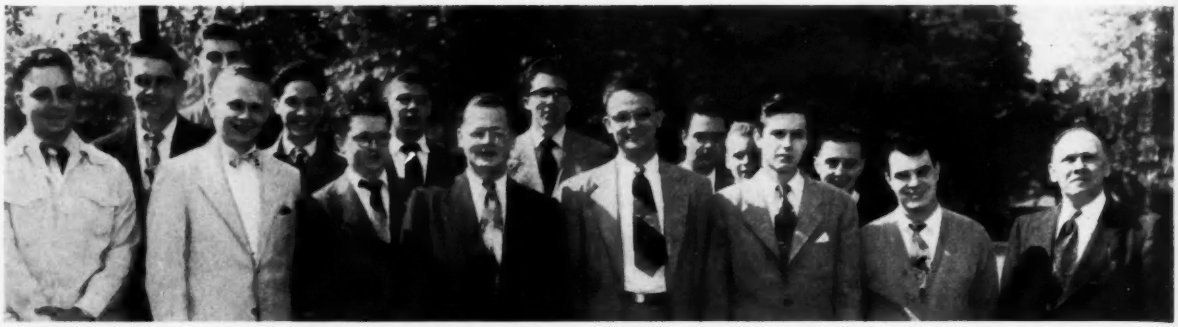
Respectfully submitted,
JOHN E A SCHRODER, *Secretary*

Northern New England Section Meeting Report

May 18, 1951
Andover Country Club, Andover, Mass

A meeting of the Northern New England Section was held May 18, 1951 at the Andover Country Club, Andover, Massachussetts. Several members arrived early enough to play a round of golf. During the business session, it was announced by C Wendall Lever, Chairman, that Margaret Jean Peters, 163 Fort Hill Avenue, Lowell, Massachusetts, has been selected as the winner of the Ralph E Hale Scholarship of the Northern New England Section.

R H Sennett, Imperial Chemical Industries, Ltd, Manchester, England, was the speaker of the evening. This paper was entitled "Trials and Tribulations of Wool Dyers".



Fairleigh Dickinson College Student Chapter

Fairleigh Dickinson College Student Chapter Completes Organization

UNDER a charter granted in Raleigh, N C on April 19 the Fairleigh Dickinson College Student Chapter completed its organization at Rutherford, N J, on May 18, with the election of Rudolph Simone, of Hawthorne, N J, as president. Other elected officers are Robert J Zecker, Garfield, N J, *secretary;* and John Florentino, Ridgewood, N J, *treasurer.*

Faculty advisors selected by the chapter include Herbert Mauersberger, director of the Textile School; George Decnyf; Charles Minoff; Herman Bauman; and Francis S Richardson.

The members also voted honorary membership to P J Wood and Paul Luck.

Awards Made to Outstanding Textile Chemistry Students at R I Meeting

THE outstanding students of textile chemistry in the graduating classes of Rhode Island School of Design, Bradford Durfee Technical Institute and New Bedford Textile Institute were each awarded a year's courtesy membership in the AATCC and a new book, Vickerstaff's "Physical Chemistry of Dyeing", at the May 25th meeting of the Rhode Island Section.

The National Council sponsors the awards given to the New Bedford Textile Institute and the Bradford Durfee Technical Institute due to the fact that they have student chapters; the Rhode Island Section sponsors the award to the Rhode Island School of Design, since that college has none.

Winners of the awards were William K Aldrich, RISD; Lynwood I Gibson, BDTI; and Anibal L Ferreira, NBTI.

Representatives of the schools in attendance were: William D Fales, Head of the Textile School, RISD; Harold B Sturtevant, Instructor, RISD; Leslie B Coombs, president, BDTI; Dr James W Watters, Head of department, BDTI; William H Wingate, faculty advisor to the student chapter, BDTI; and Francis Tripp, faculty advisor, NBTI.

New Bedford Textile Institute Student Chapter Meeting Reports

March 26, 1951

ON March 26th, Kenneth H Barnard, manager of the Textile Resin Department, American Cyanamid Company, addressed the New Bedford Textile Institute Student Chapter on the subject of synthetic resins and their application to fabrics. A film, "It's All in the Finish" was shown in conjunction with the talk.

May 3, 1951

THE final meeting of the year was held on May 3, at which Raymond W Jacoby, research director of Ciba Company, presented an address "The Ever-changing Field of Textile Chemistry." Mr Jacoby illustrated his talk with an impressive display of fabrics, which had been subjected to various processes and finishes.

Respectfully submitted,
BEVERLY ROSS, *Secretary*

Philadelphia Textile Institute Student Chapter Meeting Report

ON April 26th, 1951, before the Philadelphia Textile Institute Student Chapter, Harry L Morgan of James Lees and Sons Company discussed the problems arising from wool scarcity and high prices, and the necessity of substituting synthetic fibers.

Respectfully submitted
HARRY A ROSELLE,
Secretary

Bradford Durfee Technical Institute Student Chapter Meeting Report

May 3, 1951
Stevenson's Inn, Westport, Mass

ON May 3, the Bradford Durfee Technical Institute Student Chapter, in conjunction with the school's American Chemical Society student chapter, held its annual banquet at Stevenson's Inn. Stanley Dubiel, president of the ACS student chapter and Norman Weinstein, president of the AATCC student chapter, presided jointly.

Guest speaker for the evening was Dr George M Gantz, research director of the Lonsdale Company, Lincoln Bleachery & Dye Works Division. His topic was "Synthetic Fibers, Their Properties and Uses in the Textile Industry".

Among the honored guests at the banquet were Raymond W Jacoby, Rhode Island Section Councilor and recently-named recipient-to-be of the 1951 Olney Medal, and Peter G Kolupaev, Rhode Island Section Chairman.

The meeting was concluded with the presentation of three movies, "Jet Propulsion", "Synthetic Rubber", and "Atomic Test at Bikini".

Respectfully submitted,
EDWARD W MAKUCH, *Secretary*

N Y Outing Set for June 15

THE Annual Outing of the New York Section will again be held at the North Jersey Country Club, Wayne Township, N J, on June 15. In addition to the golf tournament, there will be the usual driving contest, putting contest, horseshoe pitching, card playing, etc.

A buffet lunch is scheduled for noon. The dinner at 7 will feature a choice of roast beef or lobster.

The outing committee consists of Ernest J Gsell, *Chairman,* Fred L. Gonnerman, Chris W Farrell and Robert F Holoch.

ABSTRACTS

Aspects of Acetate Rayon Dyeing. A Survey of Progress.

Anon, *Skinner's Silk & Rayon Rec* 25, 137, 140, 271-2, January and February, 1951.

It is well-known that the original cellulose acetate as first produced had little or no affinity for the ordinary types of dyestuff. It was this fact that gave rise to the work of Ellis and others in the search for dyestuffs that could be used for coloring this fiber.

At present, the most important groups of dyestuffs for acetate are the anthraquinone, azo and insoluble azoic types, applied in the form of colloidal dispersions.

With the development of the dispersed dyes it became obvious that the coloring of acetate was not an ordinary dyeing phenomenon. Cross-sections of fiber revealed that the dye was fully absorbed and gave a solid colored effect through the complete fiber section. This gave rise to the solid solution theory that the acetate itself was a solvent for the dyestuff.

Completely acetylated cellulose was found to be unsuitable for spinning, as the solubility in acetone was low. By partial hydrolysis a product was obtained with 52-54 per cent of acetyl groups, which proved to be satisfactory for spinning and also better for dyeing, since the tri-acetate was quite waterproof.

Dyeing acetate rayon is a much slower process than dyeing viscose rayon, due to the much slower swelling of the acetate as compared with the viscose. This is shown by the fact that wet swelling of viscose varies from 35 to 65 per cent, while wet swelling of acetate varies only from 9 to 14 per cent. These latter figures, however, may be increased by the addition of suitable solvents, such as cyclohexanone, to the dyebath.

The basic factor in all dyeing processes of this type is thorough dispersion of the dyestuff. Suitable dispersing agents are soap and Turkey red oil. The use of water of zero hardness is always preferable, and where this is not obtainable the use of water-softening agents must always be considered.

Partial saponification of the acetate is sometimes applied to assist in the dyeing with dispersed dyes or impart affinity for direct and developed dyes. When hydrolysis of only the outer layers is required, treatment with weak alkalis in the form of sodium carbonate or caustic soda may be applied. This brings about a slight swelling of the outer layer, which not only increases absorption of the dispersed types of dyes but promotes better penetration of the inner layers and speedier dyeing.

It should be pointed out that when saponification is carried out for the purpose of imparting affinity for direct dyes, care should be taken not to impoverish the fabric. Instances have been known when as much as ten per cent in weight has been lost by hydrolysis, accompanied by a certain amount of tendering of the material. When a high degree of saponification is required, the use of carbonate of potash solutions is recommended in a special technique involving steaming of the fabric after impregnation of the alkali. This method of saponification is used on fabrics which are to be dyed and discharged with white and colored patterns.

Acetate processed at high temperatures, especially from 180° F to boiling point, is liable to lose its luster, due to the excessive swelling of the fiber. This is taken advantage of in the production of soap-delustered fabrics. On the other hand, when the luster of the fabric must be preserved, the use of high temperatures should be avoided.

The light fastness of acetate dyeings is interesting by comparison with other types. It has been pointed out that acetate rayon is probably very easily penetrated by the actinic or ultraviolet rays, and this is thought to explain the decreased fastness to light of the vat dyes on acetate as compared with cotton.—WHC

Modification of Wool by the Application of Linear Synthetic Polyamides I—*N*-Methoxymethyl Polyamides

D L C Jackson and M Lipson, *Textile Research J* 21, 156-63, March, 1951.

The properties of wool which are most likely to be modified by the application of synthetic resins are: felting shrinkage, abrasion-resistance, crease-resistance, handle, and dyeing properties. In general, felting shrinkage is reduced, while abrasion-resistance is often increased by synthetic resin treatment, the magnitude of the change being determined by the type of resin used and its method of application.

The paper describes work carried out to determine the effect of polyamides and modified polyamides on the abrasion-resistance and felting shrinkage of wool. The polyamide used was nylon, polyhexamethylene adipamide, and this was modified by the introduction of hydroxymethyl and methoxymethyl groups.

The *N*-methoxymethyl nylons are shown to be much more effective than nylon itself, when applied from solution, in increasing the abrasion-resistance of wool fabric, but not in decreasing the felting shrinkage of the fabric. If the *N*-methoxymethyl nylon is first applied to the wool fabric from alcoholic solution and then hydrolyzed *in situ* by approximately 2*N* hydrochloric acid, the polymer is found to confer nonfelting properties on the wool. A deposit of approximately 3% by weight of polymer has been found to eliminate entirely the felting shrinkage of wool fabric under the conditions of test. The optimum degree of substitution of the nylon for the production of nonfeltability is between 5% and 6% combined formaldehyde, which corresponds to between 20% and 24% —NH groups substituted.

The effectiveness of these polymers in increasing abrasion-resistance and decreasing felting shrinkage is explained on the basis of their adhesion to and covering power on the wool fiber.—WHC

A New Way to Flameproof Nylon

R C Axtmann and A T Sweet, *Textile World* 101, 130, 216, March, 1951.

A good, wash-fast fire retardant has been developed by du Pont to meet the demand created by the continued introduction of nylon fabrics into uses which require high standards of fire resistance. The treatment, in the form of a thiourea-formaldehyde resin, will materially reduce the flammability level of a nylon fabric when that fabric is, for any reason, more flammable than pure, undyed nylon.

A clean nylon fabric is normally considered to be fire-resistant, since it does not propagate a flame when the source of fire is removed. This property is partly a result of the relatively low melting point of nylon yarn (about 500°F) which allows the burning fiber to drip away from the rest of the fabric and prevents the spread of flames. However, the flammability of nylon may be increased beyond the allowable limits of fire resistance in several ways: by blending it with certain other fibers; by applying certain sizing materials; and by dyeing it with metallized dyes, such as the chrome colors. In such cases, molten nylon is prevented from dripping away from the fabric and flammability is increased. For example, a mixed fabric of

nylon and Fiberglas will burn because the Fiberglas acts as a supporting framework for the molten nylon. The application of the thiourea-formaldehyde resin tends to counteract such effects.

Directions are given for preparing the resin and applying it to the fabric. As an indication of the washfastness of the treatment, it is stated that three launderings (AATCC No 3) in a Launder-Ometer do not increase the flammability. This flameproofing treatment may also be combined with a waterproofing treatment if desired by the addition of Zelan.—WHC

Studies in the Fundamental Processes of Textile Printing

II—The Influence of Thickener Composition on Dye Transfer during Steaming.

D A Reilly and H A Turner, *J Soc Dyers Colourists* 67, 103-15, March, 1951.

In a previous paper, a new experimental procedure was described, by means of which might be studied the migration of water-soluble, substantive dyes from the film of thickener to the fiber substance in the steaming process for textile prints. This procedure was designed to reproduce the conditions which exist during the technical process after the fabric has been printed and dried. The study was confined to the transfer behavior of the direct dyes from a starch thickener to cellulose. In this way, attention was concentrated on the diffusion of dye molecules into the cellulose during steaming.

This previous work has now been continued. The same experimental procedure was adopted without essential modification, using a solid film of thickener substance and a film or regenerated cellulose (cellophane) in contact with it. A single pure direct dye, Chlorazol Sky Blue FF (C I 518) was used throughout.

Films were made from a variety of natural starches and other typical thickening agents, including British gum, gum tragacanth, cellulose methyl ethyl ether, sodium alginate, and a starch carboxy ether. The general characteristics of dye transfer over the steaming period are similar for most of the thickeners examined, but the proportion of dye transferred at equilibrium may vary considerably between one thickener substance and another. The presence of appreciable numbers of anionic groups in the thickener molecule may lead to the rapid and complete transfer of dye to the cellulose. Possible relations between the chemical constitution of the thickener and the efficiency of dye transfer are discussed.—WHC

Observations on Enzymes for Textile Processing.

J H Downey, *Textile Age* 15, No 3, 30-2; No 4, 70-1 (1951).

The main function of enzymes in textile processing is the removal of size in yarns and fabrics. Enzymes are nitrogenous bodies soluble in water, and are nonliving constituents of a wide variety of ferments and molds. For example, germinating grain contains diastase which, by diastatic action, turns starch into sugar. Pepsin and trypsin have similar functions and are contained in the juices of the digestive tract. All enzymes become inactive at raised temperatures.

The chief source of diastatic enzymes for textile uses is malt extract, while pancreatic enzymes have also been used in a similar fashion for starch removal.

In desizing cotton and rayon, the first step is to confirm the presence of starch in the yarn or fiber. This is generally carried out by treating the material in a solution of iodine, when the blue color of starch iodide indicates the presence of starch. The test should also be applied after the goods have been desized, to indicate either the amount of unchanged starch still left in the fabric or the percentage of solubilized starch that has not been washed out of the goods. In the latter case a reddish brown color will show that the starch has been changed to dextrine and sugar.

Where sufficient capacity is available, the best method is to maintain the fabric in a bath of 1 per cent malt extract for one to two hours at 140-150°F and a pH of 6.0-7.5, using brom-thymol blue as indicator, with subsequent copious hot rinsing at not less than 180°F. Failing this, the goods should be impregnated with the malt liquor at 140°F and allowed to lie in pile for several hours, usually covered with cloths soaked in desizing liquor, followed again by the usual hot rinsing.

Enzymes are also used for the complete removal of starch thickenings used in printing, which are still left in the goods after soaping.

In many types of filament rayon fabric, gelatine and oil mixtures are used in sizing. Generally speaking, sizes of this type can be removed by hot rinsing, with the addition of synthetic detergents of the sulfated fatty alcohol type. On the other hand, where sizing is heavy, and long storage has assisted in the fixation of the gelatine, more pronounced treatments may be necessary. Such treatments are carried out by the proteolytic enzymes of the pepsin and trypsin types, which solubilize the gelatine and assist in its easy removal in subsequent hot rinsing.

Attempts have been made to degum natural silk with enzymes, but apparently without much success. It has been pointed out that silk degummed with enzymes shows a loss of strength.

Malt extract is used along with lactic acid, soluble starch and oil emulsions to impart varying degrees of scroop and brightening to viscose rayon yarns or fabrics. Enzymes are also used to produce the soluble starch which is used in finishing to add weight to fabrics.—WHC

Zirconium Chemicals: Their Application to Textiles.

W B Blumenthal, *Rayon Synthetic Textiles* 31, 81-3, December, 1950; 32, 85-6, 88, January; 79-80, April, 1951.

Zirconium is an element which has made but a small beginning in its application to textiles, but for which a broader future may be anticipated.

When zirconium salts are dissolved in water, they form ions of zirconium. These ions show strong tendencies to adhere to textile surfaces. If, for example, a section of cotton cloth is dipped into a solution of zirconium oxychloride, zirconyl acetate, or ammonium zirconyl carbonate, then removed and rinsed, a considerable amount of zirconium is found to remain in the textile, and the chief effect of its presence is to render the cloth water-repellent. Not only cotton, but linen, rayon, silk, wool, and nylon have been observed to behave similarly when treated with solutions of these salts. The reason for this retention of zirconium by the fiber is explained by the author.

It was established early that for best results for water-repellency zirconium salts should not be used alone but preferably in conjunction with other substances, particularly soluble soaps and wax emulsions.

It has been found that treatment at ordinary room temperatures, with very brief immersion, and low concentrations of zirconium compounds, may lead to the highest quality water-repellence. Analysis has shown that the amount of zirconium oxide left in a treated fabric need be only 1 per cent or less of the weight of the fabric.

The most widely used zirconium salt for textile applications is zirconyl acetate, having a pH of 3.8. Where no acidity is permissible, ammonium zirconyl carbonate, with a pH of 8.2, may be substituted.

The author stresses the fact that zirconium compounds are not toxic and may be used safely in contact with the human body. He suggests that they have possibilities as deodorants and germicides.—WHC

NEWS

COMING EVENTS

AMERICAN ASSOCIATION OF TEXTILE TECHNOLOGISTS

Meetings: September 12, October 3, November 7, December 5 (Builders Club, New York).

AMERICAN CHEMICAL SOCIETY

Meetings: September 3-7 (New York, N Y).

AMERICAN LEATHER CHEMISTS ASSOCIATION

Convention: June 11-13 (The Griswold, Groton, Connecticut).

AMERICAN SOCIETY FOR TESTING MATERIALS

Annual Meeting, June 18-22. Atlantic City, N. J.

Spring Meeting and Committee Week, March 3-7, 1952, Cleveland, Ohio.

Annual Meeting, June 23-27, 1952, New York, N. Y. (The biennial Apparatus and Photographic Exhibits will be held in conjunction with this meeting).

FIBER SOCIETY

Meetings: September 13-14 (Swampscott, Mass.); April 16-17, 1952 (Clemson House, Clemson, S. C.)

NATIONAL ASSOCIATION OF TEXTILE MACHINERY MANUFACTURERS

Exhibit of American Textile Machinery, April 26-May 1, 1954, Atlantic City Exhibition Hall, Atlantic City, N. J.

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION OF THE UNITED STATES

Luncheon Meetings—Hotel Commodore (September 12, October 10, November 14).

Spring Outing—The Greenbrier, White Sulphur Springs, W Va (June 14-16).

Annual Meeting and Dinner—Hotel Commodore (December 11).

TEXTILE RESEARCH INSTITUTE

Annual Meeting, Nov. 8-9.

• Burkart-Schier Textile Manufacturing Division Celebrates Silver Anniversary

The Gold Room of the Read House, Chattanooga, Tenn, was the setting on May 11 for the 25th anniversary celebration of the Burkart-Schier Chemical Company's Textile Manufacturing Division. The Division was formed on May 11, 1926, nearly four years after the establishment of Burkart-Schier in August, 1922.

Those present at the affair were: C A Schier, president; W A Bentel, vice president; Mrs A C Burkart, treasurer; William J Kelly, Jr, mgr, Textile Mfg Division; J A Burkart, production mgr; Andrew J Kelly, chief chemist; Donald H Gunther, research director; Mrs Robert Varner, credit mgr; C V Day, plant sup't; T A Martin, office mgr, Mfg Division; George S McCarty, sales mgr, Chattanooga office; James A Brittain, sales mgr, Birmingham office; O G Edwards, sales mgr, Carolinas; Wallace Reynolds, Chicago sales; Edward F Jurzcak, sales and service; Mrs Glenna Goodner, sec to Mr Martin; Miss Martha Gallagher, sec to Mr Kelly; Miss Charlotte Bayol, charge of billing; William Scoggins, master mechanic; Joe Lee, maintenance; E L Fletcher, chemical consultant; Richard Schier, mgr, transportation; and Lawrence Newman, assistant mgr, Chemical sales.

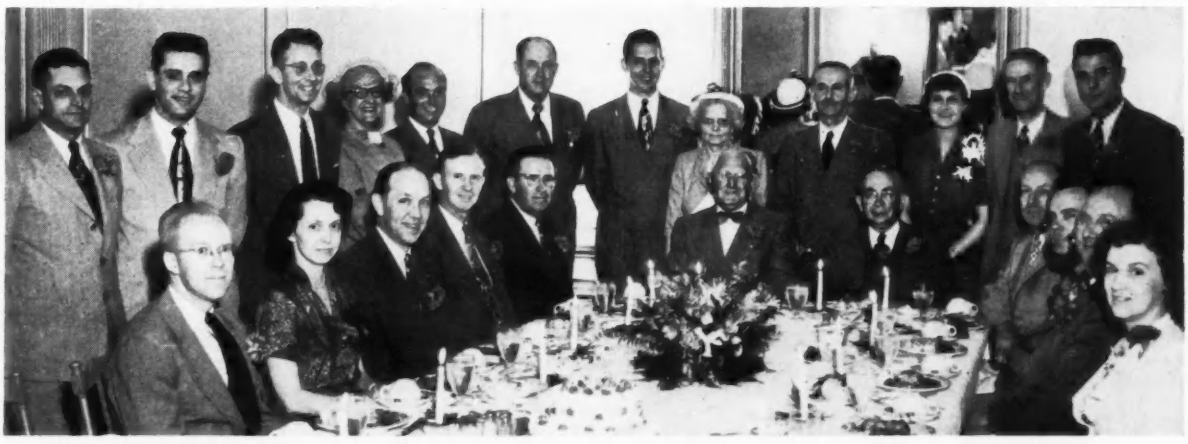
The textile manufacturing division of Burkart-Schier Chemical Company manufactures a complete range of textile penetrants, soaps, detergents, wetting and finishing agents for the textile industry. Fifty thousand dollars reportedly was spent in the past year for new equipment and plant modernization.

A new plant is now being constructed in Knoxville for the chemical division in addition to the one now operating in Nashville.

• Symposium on Measurement of Consumer Wants

R E Hess, Technical Secretary of the American Society for Testing Materials, has extended an invitation to members of organizations represented on the American Standards Association Consumer Goods Committee to attend and participate in a symposium on Measurement of Consumer Wants, to be held at the ASTM Annual Meeting, Thursday, June 21, Hotel Haddon Hall, Atlantic City, N J.

ASTM's Administrative Committee on Ultimate Consumer Goods has found that standards for such goods must be based on what consumers want. Accordingly, they have arranged this symposium to acquaint engineers with scientific development in this field. In the first session representatives of the U S Quartermaster Corps will discuss problems associated with determining soldier wants. The second session will cover researches in measuring consumer wants. The latter session has been arranged with the cooperation of Dr Pendleton Herring of the Social



Celebrants at the 25th Anniversary of the Textile Manufacturing Division, Burkart-Schier Chemical Company.

Science Research Council. The researches being reported relate to part of the activity of a Joint Committee of the National Research Council and the Social Science Research Council, of which Samuel A Stouffer of Harvard University is Chairman and C L Warwick of ASTM is a member.

• LTI Research Foundation Established

The Board of Trustees of Lowell Textile Institute announced on May 15 the establishment of the Lowell Textile Institute Research Foundation "for the purpose of encouraging and administering research sponsored by industry and government at the Institute".

The Foundation personnel and the Institute faculty will jointly constitute a staff available for investigating problems involving chemistry, physics, biology, engineering and industrial economics in the fields of textiles, paper, leather, and related areas of interest, according to President Martin J Lydon and Chairman of the Board of Trustees Harold W Leitch. Mr Leitch is General Superintendent in Charge of Research for Pacific Mills.

It was revealed that the Foundation will also have the benefit of utilizing the equipment and physical facilities of the Institute for its research and experimentation projects.

An eighteen-man Board of Directors, of which Mr Lydon and Mr Leitch will be ex-officio members, has been appointed to manage the functioning of the Foundation. The Board has chosen from among its membership the following officers:

President—Roland E Derby, Sr, Textile Aniline and Chemical Company

Vice-president—Barnett D Gordon, M K M Hosiery Mills

Treasurer—Homer W Bourgeois, Union National Bank of Lowell

Secretary—Charles J Scully, Boston College Graduate School

In addition to the above-listed chair officers, the Board of Directors also selected five of its members to serve as an Executive Committee, with Dr Walter J Hamburger, Director, Fabric Research Laboratories as Chairman. Other members include Messrs Lydon, Leitch and Derby and Prof John H Skinkle of the LTI Chemistry Department.

Dr Harold H Webber, Director of the LTI Experiment Station, has been appointed Executive Director of the Foundation. He will work closely with the Executive Committee and will be responsible for the overall administrative operations of the Foundation.

Other members of the board are as follows:

John H Pearson, Lowell attorney and president of the Lowell Chamber of Commerce. An authority on textile patents, Mr Pearson has offered his services as Counsel for the Foundation.

John J Delmore, member of the Institute's Board of Trustees and legislative agent for the American Federation of Labor.

J Milton Washburn, Jr, member of the Board of Trustees, and the New England Manager of Emery Industries, Inc.

Kenneth E Bell, Technical Director and Vice President of the A C Lawrence Leather Company, and Director of the Northeastern Section of the American Chemical Society.

Blanchard D Warren, Assistant Sales Manager for the Bird Machine Company.

Harold J Walter, President and Treasurer of the Bachmann Uxbridge Worsted Company, Director of the National Association of Wool Manufacturers, and former Director of the Textile Research Institute.

Nathaniel M Sage, Director of the Division of Industrial Cooperation at Massachusetts Institute of Technology.

Dr Frederick M Feiker, Dean of the School of Engineering at George Washington University.

Kenneth R Fox, former President of the Lowell Textile Institute and now Vice President and Director of Technical Services of the Burlington Mills Corporation.

• New Hunter Repair Station

The expansion of facilities, which will be devoted exclusively to service in the Southern territory for the Leyland-Mycock Machinery Division, has been announced by the James Hunter Machine Company. A new station at 114 McKoy Street, Greenville, S C will include complete repair and maintenance services for Leyland-Mycock Expanders, plus stocks of parts, such as rolls, bearings, frames, etc.

The station will be under the direction of Ralph C Wing.

• President Lydon's Inauguration Highlights LTI Commencement Weekend

Commencement weekend at Lowell Textile Institute began on Saturday, June 2 with the registration and business meeting of homecoming alumni and the election of a clerk, a treasurer, and five directors to serve for the ensuing year. The class of 1951 was welcomed into the alumni group and honorary awards for meritorious service were presented to President Lydon, former president Kenneth R Fox (now vice-president in charge of Technical Services for Burlington Mills Corporation), and Royal Little, president of Textron, Inc.

Following a noon banquet at the Institute, the formal inauguration of President Lydon took place at 2:30 in the Lowell Memorial Auditorium with Mr Fox giving the inaugural address. A reception was held in the Institute's new Alumni Memorial Library at 4:30.

On Sunday, June 3, at 2:30, the baccalaureate exercises were held at Temple Beth El, with George Alpert, President of the Board of Trustees at Brandeis University, presenting the address to the graduates.

Commencement exercises were held at the Lowell Memorial Auditorium at 10:30 on Monday morning, June 4, at which time President Lydon conferred five honorary degrees of master of science, in addition to one hundred and forty degrees to seniors and graduate students.

Those receiving honorary degrees were: Maj Gen Herman Feldman, the quartermaster general, commencement speaker; Dr John H Dillon, director of the Textile Foundation and the Textile Research Institute; Ralph K Hubbard, president of the LTI Alumni Association and president and treasurer of Packard Mills; Francis W White, president of the American Woolen Company; and Mr Fox.

• Macbeth Plant Facilities Doubled

The Macbeth Corporation and subsidiaries, Newburgh, N Y, have acquired a second plant in that city for the manufacture of optical and electronic instruments. The acquisition represents a doubling of present manufacturing and research facilities and a fourfold increase in plant size since Macbeth moved to its present site from New York early in 1950.

The new plant reportedly began operations earlier this month.

• Synvar Begins NC Operations

Synvar Corporation has begun operations in its Greensboro, N C, plant under the name "Synvar Southern Corporation," and will produce resins of the urea-formaldehyde, phenol-formaldehyde and resorcinol-formaldehyde types. Among other uses, the resins will have application in the sizing, creaseproofing and shrinkproofing phases of textile processing.

The plant and control laboratory are well-equipped with the most modern processing equipment for high capacity operation. Refrigerated resins will be shipped from Greensboro in drums, tank cars and tank trucks.

Synvar's main plant in Wilmington, Delaware, will continue to supply resins in solid and powder form.

• Westvaco Contracts Phosphate Expansion

Westvaco Chemical Division of Food Machinery and Chemical Corporation has disclosed that a fourth electric furnace unit for the manufacture of elemental phosphorus at its Pocatello, Idaho plant will be constructed. Two furnaces presently are in operation at this location and a third will be on the line shortly. Power will come from the hydro-electric system of the Idaho Power Company and phosphorus rock from the nearby deposits on the Fort Hall Indian Reservation. Simultaneously, the Company plans to expand its facilities for processing phosphorus into various grades of phosphates at existing phosphate plants. Completion of the fourth furnace at Pocatello and the additional facilities is contemplated by mid-year of 1952.

• U S Testing Reestablishes Providence Branch

The United States Testing Company has moved its Woonsocket Branch Laboratory to a new location at 211 West Exchange St, Providence, R I "to give mill and other manufacturing concerns in the Blackstone Valley a more complete and faster service".

The original Providence Branch was opened in 1931. The Woonsocket Branch, at which much of the testing done was on wool and worsted yarn products, has been in business since 1935. The new laboratory is prepared for more diversified activity in addition to former services.

• ASA Heads American Industrial Survey

The American Standards Association, at the request of the ECA, is currently spearheading a survey of American industry to determine the savings resulting from industrial adoption of standards. The ECA is pressing to increase productivity in Marshall Plan countries and has disclosed a need for concrete evidence of the money savings to be obtained by the adoption of sound business practices.

ASA is asking its more than 2200 member bodies, associate members and company members to participate in the survey by supplying specific data within their knowledge. The study will extend to the savings resulting from the use of all kinds of standards—those prepared under ASA procedure, standards of trade associations, technical societies, industrial groups, private companies, or whatever their origin. Firms or organizations that participate by supplying information will receive a comprehensive report of the results of the survey on its completion.

• Research Fellowship at Notre Dame to Augment PVP Work

The establishment of a research fellowship at the University of Notre Dame, under the terms of which studies will be conducted relating to the synthesis and reaction of acetylene derivatives, has been announced by the General Aniline & Film Corporation.

The fellowship will, in addition, augment work relating to polyvinylpyrolidone (PVP) already under way.

• NACM Annual Meeting Dates

The National Association of Cotton Manufacturers will hold its 97th Annual Meeting at the New Ocean House, Swampscott, Mass, September 13-14, 1951.

Tentative plans call for business sessions on the first day, and sports and entertainment on the second.

• New Textile "Revolution"

In the finale of the current series of Gossett textile lectures in the North Carolina State College School of Textiles, J Spencer Love, chairman of the board of the Burlington Mills Corporation, voiced his conviction that the nation's textile industry is now undergoing "a major revolution" comparable to that which followed the invention of the cotton gin and the loom.

Speaking before an audience of several hundred students and faculty of State College, Mr Love, a member of the board of trustees of the Consolidated University of North Carolina and a benefactor of NCSC, stated that man-made fibers is the principal cause of the sweeping changes facing the industry. Perhaps their most important characteristic, he said, is that they can be blended with other fibers—a property "not existent" in natural fibers.

Among other topics, Mr Love's remarks were centered upon the nation's general economic status, industrial working conditions, and UMT; he also paid high tribute to the School of Textiles.

Mr Love was introduced by Prof E B Grover, who presided over the meeting.

NEW PRODUCTS AND DEVELOPMENTS

• Superclean

One of the most serious problems encountered in the woolen or worsted industry is the complete removal of spinning oils from fabricated goods, raw stock or yarn. As an answer to the problem, the Charles W Berg Laboratories, 1827 North 5th Street, Philadelphia 22, Pa, have introduced "Superclean", a detergent that, they state, "will emulsify more mineral oil than any other detergent" and "will combine with any oil and convert it to a soap".

The company cites the following test to prove the product's capabilities:

"Mix one part of Superclean with four or five parts of any petroleum oil. Note that the Superclean and oil form a clear solution. Pour some of this mix into water, noting that a permanent emulsion is instantly formed. Also note that this emulsion will lather profusely."

In the fulling mill, a solution of "Superclean" and soap is said to instantly wet out the fabric.

To obtain fabrics of clear, sharp face, the product is used in the washer along with soda ash. It is pointed out that the felting properties of "Superclean" are far less than those of soap and that face outlines on fabrics scoured with this detergent and alkali are distinctly sharper than those obtained when soap is used in scouring.

The manufacturer states that "Superclean" is unexcelled for scouring fabrics that are to be piece-dyed, since it helps reduce ether and alcohol extractible residues to "mere traces" and opens the fibers for even absorbtion of dyestuff and, consequently, level dyeing.

In stock dyeing, the product is added directly to the dyebath to open the raw stock and facilitate even dyestuff penetration. Elimination of the scouring of raw stock before dyeing is reported in some mills, according to the manufacturer, by the use of "Superclean". Other advantages cited when the product is employed in the stock dye bath are: bulkier raw stock (at least 50%), elimination of hard ends and lumps, even coloring of raw stock with less dyestuff, more efficient carding, reduced noilage, and odorless and brighter stock.

Berg Laboratories suggest the addition of one or two pints to a drum of oil and water solution to increase the penetration qualities of spinning oil and aid scouring in the dolly.

In general, the manufacturer recommends that the amount of soap ordinarily used be reduced by 2-2½ oz/gal and in its place 1½ oz of "Superclean" be substituted.

• New Cotton Tentering Machine Installed at Textileather

Installation of a new machine at the Textileather Corporation, Toledo, Ohio, for the framing or tentering of cotton fabrics is expected to increase production about 30 per cent in the framing department of the Toledo Dye Works Division of the company, according to Jules D Lippmann, president.

The new machine, known as a clip tenter frame, is designed to apply finishes, and dry fabrics under tension, in addition to giving the fabric a smooth surface and removing the wrinkles. It is about 125 feet long, of modern design and is said to be the first of its kind in the textile industry. The frame replaces another which had been in operation since 1921.

The tenter frame was built by H W Butterworth & Sons, Philadelphia, and the ovens, designed by Textileather engineers, were fabricated by the Ross Engineering Company, Detroit.

Various finishes, including sizing, mildew-, fire- or water-resistant treatments, may be applied.

Following application of the finish, the cloth passes through a series of three ovens (while on the frame) where it is dried into shape. Distances between the sides can be adjusted to cloth width allowing stretching to any desired width while drying. A winding device winds the cloth into large rolls and governs lengthwise tension during the operation.

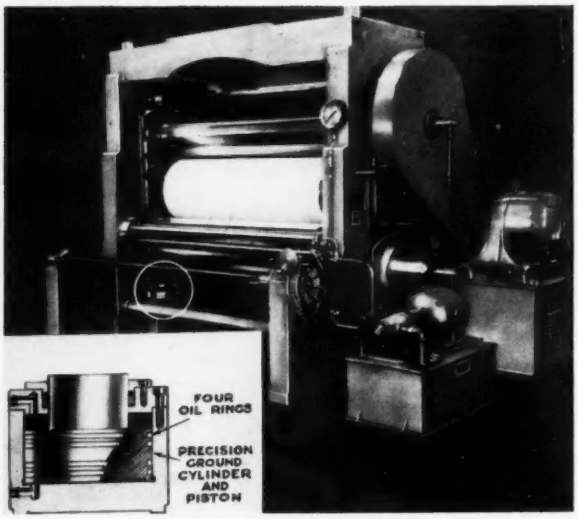
The gas-fired ovens of the machine are designed for even and speedy drying and are reported to be completely insulated. A recirculating device is used in the ovens to permit recirculation of about 75% of the heated air.

Cotton fabric is reportedly run through the machine at 120 yards per minute as compared to a former speed of 50 ypm. This is said to be attributable to the higher temperatures available in the ovens.

The machine, installed by Textileather workmen, is controlled by a package DC electrical unit, which governs power to the various drive motors. Throughout the installation are electrical temperature instruments which are recording constantly. Textileather engineers said that more than 15,000 feet of wire were used in the installation of automatic controls, blower fans and instruments.

Advantages of the new installation, stated Mr Lippmann, are the increased capacity and the achievement of better control because of uniform tension on the frame.

The complete machine is reported to have been shipped to the Textileather Corporation in three railroad freight cars and five motor trailers.



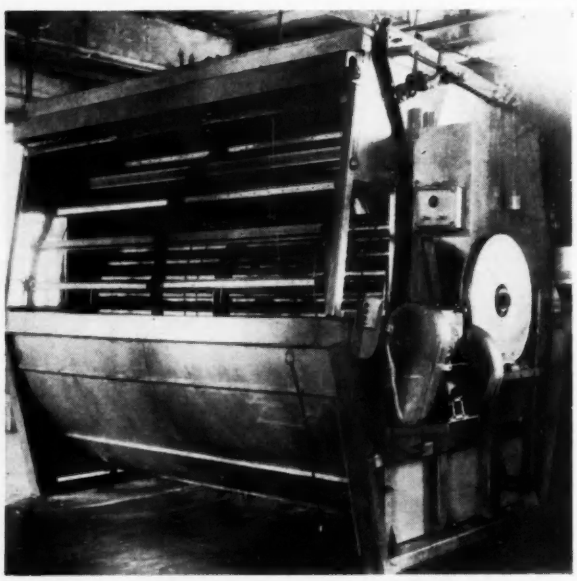
Van Vlaanderen 80-ton Hydraulic Calendar

• Van Vlaanderen Improves 80-ton Calendar

As the most recent improvement in their 80-ton calendar, the Van Vlaanderen Machine Company, 370 Straight Street, Paterson, N J, has redesigned the hydraulic system in two ways. The cylinders and pistons have been enlarged to maintain an 80-ton nip pressure at an oil pressure of only 770 pounds per square inch instead of 2000 pounds as previously required. Periodic disassembly of the pressure cylinder unit for replacement of the old type ram packing has been accomplished by building the entire cylinder unit of forged steel with accurately machined cylinders and pistons and using four step seal piston rings. Van Vlaanderen reports that with the high precision manufacturing design, maintenance necessitating costly down time is virtually eliminated.

• Dye Machine Utilizes Yarn Carrying Spokes

Yarn-carrying spokes of stainless steel tubing are used in the Klauder-Weldon dyeing machine (pictured below) for immersing the skeins in dye liquor. The Carpenter Steel Company Alloy Tube Division, Union, N J, reports that the spokes are not affected by yarn-damaging corrosion. Machine down-time for spoke replacement is said to be reduced considerably, as the stainless steel stands up well for long periods of time at high temperatures.



Klauder-Weldon Dyeing Machine

"Tag" Model 8352, Type 1 Controller Showing New Lock Cover

• Design Improvement in "Tag" Nonindicating Controller

The Tagliabue Instruments Division, Weston Electrical Instrument Corporation, 614 Frelinghuysen Avenue, Newark 5, N J, has revealed an important improvement in the design of the "Tag" nonindicating controller for temperature-pressure. A lock on the cover of the instrument for "locking in" control point settings is aimed at eliminating financial, labor and time losses which might be caused by unauthorized persons who willfully or accidentally change control point settings.

The control setting mechanism is a spindle with a slotted tip placed entirely behind the locked cover of the case. Adjustment of the control is made by unlocking and removing the cover, inserting a screw driver in the slot of the spindle, and turning in the desired direction. Once set, the control is locked in by replacing and locking the case cover.

The instrument, known as Model 8352, Type 1, features a cover lined with a rubber gasket. It is available for either direct or reverse acting control applications, and operates on the same principle as the previous "Tag" model. Measurements are 5¾ inches by 7¼ inches.

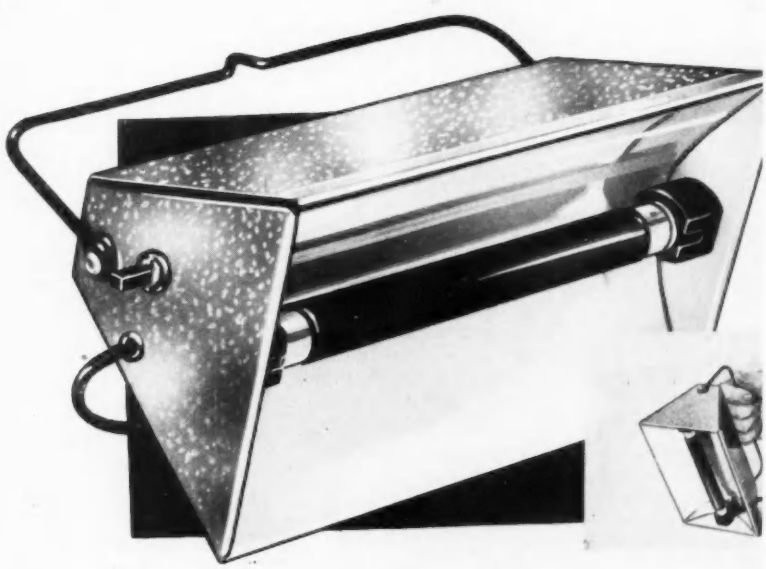
• "Black-light Rays Yield Fluorescence

A new line of Blak-Ray high-intensity long wave ultra-violet lamps, which when directed at certain substances causes them to radiate a color different from their own, i e, fluorescence, has been announced by Ultra-Violet Products, Inc, South Pasadena, Cal. The lamps are said to make invisible variations (or those nearly so) stand out with "startling" clarity, thereby suggesting their use for observing, analyzing and comparing materials, weaves, dye lots; inspecting for flaws and variations; "invisible" marking during manufacture; locating oil spots on fabrics and tracing to their origin; and displaying and merchandising manufactured items.

Blak-Ray lamps are Underwriters' Laboratories Approved and are equipped with a self-filtering "Black-Light-Blue" tube that is said to allow the long-wave ultraviolet rays (3660A) to pass through; undesirable rays in the visible portion of the spectrum are filtered out, however. No additional filters are required and the cool-operating tubes will last for 2000 to 3000 hours, it is reported. Recommended for use at low light-levels, they do not, according to the manufacturer, require as great a degree of darkness as lamps using separate filters.

Available in 4, 8, 15, 30, 40 and 80 watt sizes, the Blak-Ray fixture may be rested on a flat surface mounted flush to wall or ceiling, or hung from brackets. The 4 and 8 watt sizes have a trunnion type bail that allows them to be tilted to any position within a 180 degree plane of the mounting surface. These models may also be used as portable inspection lights. They are said to weigh 1¾ lbs and have an over-all dimension of 3¼" x 4" x 6½". Price: $14.75 complete.

Full information may be obtained by writing to Department *ADR*, Ultra-Violet Products, Inc, South Pasadena, Calif.



Blak-Ray Ultra-Violet Lamp

• Pennsalt Offers Copper Ammonium Fluoride Complex as Mildew-Proofing Agent

A free-flowing powdered copper ammonium fluoride complex, soluble in water, is being made available for evaluation purposes by the Pennsylvania Salt Manufacturing Company following laboratory tests at the Company's Whitemarsh Research Laboratories and extended field evaluation.

The dry formulation represents an improvement over the liquid in that dilutions as low as 0.04% copper may be made without the necessity of adding ammonium hydroxide in order to maintain stability.

Textiles may be soaked or padded. Treatment may follow vat, mineral or sulfur dyeing, according to Joint Army-Navy Specification JAN-D-504, which lists it as a suitable aftertreatment for duck and twill.

Further information may be obtained from Pennsalt Chemicals, Market Research Division, 1000 Widener Building, Philadelphia 7, Pa.

• Polymeric Plasticizer Suggested as Vinyl Stabilizer

The dual effectiveness of a low-viscosity polymeric resin as both a plasticizer and a stabilizer has led Rohm & Haas Company to suggest its significance in aiding the tight supply of cadmium and lead stabilizers.

The Resinous Products Division of the Company, on the basis of laboratory testing and field results, indicates that Paraplex G-60 exerts such action. It is pointed out that polyvinyl chloride films plasticized with this resin and containing no stabilizer whatsoever show surprisingly good stability, though the addition of some supplementary stabilizer is generally recommended. Reportedly, the presence of G-60 as a plasticizer permits the quantity of stabilizer to be halved, even for the most rigorous conditions of processing and exposure. Several other plasticizers which, without the addition of the Paraplex, are unacceptable from a stability standpoint are said to be definitely "upgraded" by the resin.

Tests using activated carbon have been reported, which demonstrate the product's low volatility. It is also reported to be considerably lower in density than vinyl film, which is sold on the basis of square yardage and thickness.

Stabilization effects of G-60 on polyvinyl chloride stock are brought out by Rohm & Haas in the following table:

Formulation	*PARTS*		
Geon 101	100	100	100
Paraplex G-60	0	0	50
Phosphate-type plasticizer	50	50	0
Stabilizer	1.5	4.0	1.5
Heat stability (hours)*	¼	¾ to 1½	Over 4

* Time required at 350 C to produce marked discoloration.

Successive plant expansions, the most recent having occurred only a few months ago, have tripled production capacity for this resin, and raw material supplies appear adequate to meet anticipated needs, according to Rohm & Haas Co production authorities.

• Antara Dyestuffs for Core Making

At a recent meeting of the Core Manufacturers Association, Dr G O Altmann, Research Chief for G A & F Carbonyl Iron Powders, announced the successful development of a group of dyestuffs that can be incorporated with the carbonyl iron powder in core production to identify various types of cores for special uses.

The new core dyes are reported to be stable under humidity, temperature and a wide range of molding pressures. They are said to show their colors in all shapes and over long periods of time, leading Dr Altmann to state that "now the dye won't die in the die."

A very small percentage of the strong dye is used, and though there is a slight reduction in permeability, the manufacturer states that it is offset by the sure identification, time-saving and simplification of assembly procedure achieved in the production of electronic equipment.

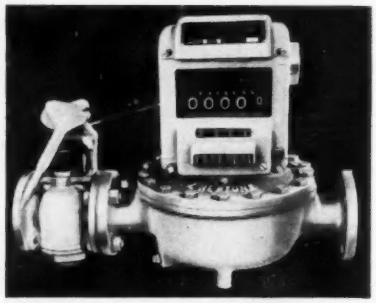
G A & F Carbonyl Iron Powders are sold by the Antara Products Division of General Dyestuff Corporation.

• Auto-Meter Stop

For automatic and accurate control of soap solutions, cold, warm and hot water, etc, in textile plants, the "Auto-Stop" liquid meter has been released by Neptune Meter Company, 50 West 50th St, New York 20, N Y. The instrument consists of a Model 432 register mounted on the Neptune liquid meter, coupled with a quick-closing valve. This meter, inserted in the line near the washers or other processing tanks, automatically shuts off the flow after a predetermined quantity of liquid has been delivered.

Typical applications of this new meter are: measurement of soap solutions to washers and fulling mills in woolen and worsted mills, measurement of water to starch cooking kettles, and measurement of warm, hot or cold water into all kinds of batching and processing operations.

The tripping mechanism is first set by pushing register buttons until the number of gallons desired shows up on the numeral wheels just above. The register



Neptune "Auto-Stop" Liquid Meter

is then cleared back to zero by turning the reset handle at the right; the valve is opened, thereby freeing the operator. The tripping device automatically cuts off the flow when the exact quantity is delivered, it is reported.

The large numerals on the face of the meter keep pace with the flow, and provide a visual check when the delivery is finished. The small shuttered totalizer (also on the face of the register) keeps cumulative totals.

Flow can be stopped without affecting the meter reading or the setting by pressing the emergency stop button on the register. The delivery can be continued to its conclusion by reopening the valve, or the register can be reset for a new quantity before continuing without affecting totalizer recordings.

The dust and weatherproof register is furnished in 1", 1½" and 2" sizes. Capacities are from 30 to 100 gallons per minute, depending on size of meter and maximum temperature selected.

• New Acid for Dyeing Loose Wool

Daniel H Jones Laboratories, 222-226 Liberty Street, Camden 4, N J, formerly mothproofing consultants and now manufacturers of Mothproofing Compound 202, have recently introduced a new acid for the dyeing of loose wool, which has been carbonized with aluminum salt.

"Jones Acid" is said to prevent the metal content of the wool from precipitating the dyes loosely on the surface of the fibers, thus assuring more uniform distribution of the color, and greater tinctorial value with maximum fulling fastness. In the application of dyestuff, the new product is reported to be considerably stronger than acetic acid 55% and slightly weaker than formic acid 85%.

Information and samples are now available from the company's home offices and/or their New England Representatives, Massasoit Products Company, West Springfield, Mass.

NAMES IN THE NEWS

John P Redston

• Redston Received Meritorious Service Award

JOHN P REDSTON, sales manager of the Textile Chemicals Department of E F Drew & Co, Inc, New York, N Y, has been awarded the Meritorious Service Award by the Textile Technical Federation of Canada. The award was presented to Mr Redston in recognition of his prominence in all activities of the Textile Technical Federation of Canada and the Canadian Association of Textile Chemists and Colourists.

Mr Redston served as General Chairman of the First and Second Canadian Textile Seminars held at Queens University in Kingston in 1948 and 1950 and has been prominent over 15 years in the activities of the above associations.

The presentation was made at the annual meeting of the CATCC on April 21, 1951.

• Bonnar Guest at ACS Carolina-Piedmont Section

J ROBERT BONNAR, AATCC vice president, was the guest speaker at the 57th regular meeting of the Carolina-Piedmont Section, American Chemical Society on May 25 at the Wiscassett Memorial YMCA in Albemarle, N C.

In his talk, "Ramification of Dye Application Techniques", Mr Bonnar discussed problems of dyestuff application on wool, nylon, Orlon, Dynel, etc, and further enlarged upon the use of dyestuffs on leather, paper, rubber and plastics. The use of color in paints, lacquers and printing inks was also briefly touched upon.

T R SMITH, manager of Wiscassett Mills Company's Yarn Dyeing Department, is Chairman of the Section's Arrangement Committee.

• Westvaco Appointments

Westvaco Chemical Division of the Food Machinery and Chemical Corporation has announced the appointment of W N WILLIAMS as operating vice-president with headquarters in New York. Mr Williams has been associated with Westvaco and its predecessor companies for over 20 years, most recently as vice-president of production in New York.

Two assistants, DR K C RULE and ROBERT J DELARGEY have been named to Mr Williams' staff. Dr Rule has been assistant production manager at New York, and was formerly staff assistant to the plant manager and head of Process Control at Westvaco's South Charleston, West Virginia plant. Prior to joining Westvaco, Mr DeLargey was superintendent of Shell Chemical's Pittsburg, California, Ammonia plant and more recently assistant general manager of Grove Regulator Company of Oakland, California.

S PHILLIP MARCUS, former assistant to the manager of the South Charleston plant, succeeds Dr Rule.

Simultaneously, ROBERT A BONDURANT, JR has joined Westvaco's production staff in New York. He was formerly executive vice-president of Michigan Chemical Corporation, St Louis, Mich.

• Heads Plastics Industry Group

GORDON BROWN of Montclair, N J was elected president of the Society of the Plastics Industry, Inc on May 24 at the group's annual national meeting in White Sulphur Springs, W Va. Mr Brown, a founder of the SPI fourteen year's ago, is a vice president of Bakelite Company, a division of Union Carbide and Carbon Corporation.

Gordon Brown

Ralph L Carr

• Ralph L Carr

RALPH L CARR has been appointed manager of the technical service department of Mathieson Chemical Corporation. He will report to Dr George P Vincent, director of product development.

Mr Carr, the author of numerous papers and booklets on ammonia, caustic soda and chlorine, was instrumental in developing the Mathieson open width steamer.

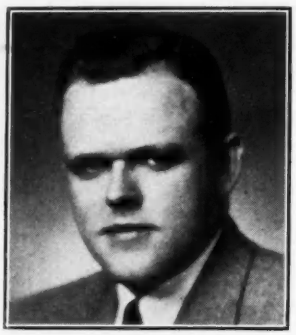
• Joseph G Donharl

JOSEPH G DONHARL, formerly associated with the Textile Resin Division of Rohm & Haas and American Cyanamid, is now managing the Philadelphia District of Pennsylvania, New Jersey, Delaware and Maryland for the Woonsocket Color & Chemical Co, Woonsocket, R I. Mr Donharl will take over the offices that Woonsocket Color & Chemical Co maintain in Philadelphia at 6100 State Road. He plans to service the Philadelphia district from stock in Philadelphia and will handle the textile specialties, chemicals and dyestuffs manufactured and distributed by Woonsocket.

• H L Ericson, T A Ruble

Continental Carbon Company has announced the appointments of HARRY L ERICSON as chief chemist of their Amarillo (Texas) Laboratory and T A RUBLE as technical supervisor.

Prior to coming to Amarillo, Mr Ericson had been associated with Witco Chemical Company's research laboratories both in New York and Chicago. Mr Ruble was formerly associated with the research department of the Phillips Petroleum Company.



W H Feathers

• W H Feathers Awarded Fellowship

WILLIAM H FEATHERS, general superintendent of the Niagara Falls Works of National Carbon Company, a Division of Union Carbide and Carbon Corporation, has been awarded an Alfred P Sloan Fellowship for Executive Development, at Massachusetts Institute of Technology. The Fellowship, as previously noted, provides for an intensive one year program of study of the problems of business management, industrial and human relations in industry, and the responsibilities of industry to national and international problems. The practical problem approach to business will be supplemented by a study of underlying problems in industrial relations, financial management, marketing methods and research, production and accounting.

Mr Feathers joined the National Carbon staff at Niagara Falls in 1937. He is being granted a leave of absence; upon completion of the program he will return to National Carbon.

• Title Changes in Mellon Institute

New bylaws adopted at the annual meeting of the Board of Trustees of Mellon Institute have changed the title of the Institute's head, DR EDWARD R WEIDLEIN, from director to president. Dr Weidlein has also been elected chairman of the board. As in the past, when he was director, Dr Weidlein continues to be the chief executive officer of the corporation, and, as previously, is in charge of the active management of all its affairs. He is responsible for all orders and resolutions of the Board being carried into effect, and signs for the Corporation all agreements and formal instruments under its seal.

The election was in accordance with new bylaws adopted by the Board, which require that a chairman, a vice-chairman, and a president be chosen at each annual meeting.

JOHN G BOWMAN, President-Honorarius of the University of Pittsburgh, with which Mellon Institute is allied cooperatively, was made vice-chairman of the Board. GEORGE W WYCKOFF, a Vice President of T Mellon & Sons who joined the Institute Board a year and a half ago, was elected secretary. The other Trustees are PAUL MELLON, RICHARD K MELLON, and ALAN M SCAIFE. EDWARD B CLARKE was appointed treasurer.

Concurrent with these changes, the following assistant directors have been named directors of research: E WARD TILLOTSON, WILLIAM A HAMOR, GEORGE D BEAL, LEONARD H CRETCHER, and GEORGE H YOUNG. HARRY S COLEMAN, another former assistant director, is now director of engineering. He retains his position as assistant secretary and assistant treasurer. The duties of these directors will remain the same as in the past. HOWARD C DAVIES, assistant treasurer and auditor, becomes comptroller and also assistant secretary and assistant treasurer. JOHN R BOWMAN, Head of the Institute's Department of Research in Physical Chemistry, has been added to the Executive Staff of the Institute.

S V Dubiel

• S V Dubiel, P H Terry

The fourth and fifth graduate fellowships to be awarded to graduating students of Bradford Durfee Technical Institute were announced recently by President Leslie B Coombs. The recipients of these new fellowships are STANLEY V DUBIEL, JR of Fall River, Mass, and PAUL H TERRY of Segreganset, Mass.

Mr Dubiel, a chemistry major at BDTI has been awarded a teaching fellowship at Northeastern University for 1951-2. Mr Terry, also a chemistry major, has accepted a graduate assistantship in chemistry from Washington University, St Louis.

P H Terry

TECHNICAL LITERATURE

Tennessee River Drainage Basin —A Cooperative Report on Water Pollution

Federal Security Agency
Public Health Service
Washington, D C

This summary report on water pollution has been prepared by the Division of Water Pollution Control, Ohio and Tennessee Drainage Basins Office, Public Health Service on the basis of information supplied by the Tennessee Valley Authority, the Alabama State Department of Health, the Georgia State Department of Health, the Kentucky Water Pollution Control Commission, the Mississippi State Board of Health, the North Carolina State Board of Health, the Tennessee Stream Pollution Control Board, the Virginia State Water Control Board.

Part I of the report covers the Tennessee River Drainage Basin Report. Text material includes summaries and recommendations, general description, historical background, physical characteristics, climate-hydrology, economic development, uses of water resources, pollution contributed to water resources, damages to water resources from pollution, benefits resulting from pollution prevention and abatement, measures required and in effect. Also included are maps of the basin, sources of pollution, existing treatment works, project requirements and existing primary water uses, as well as tables on municipal and industrial sources of pollution and existing treatment facilities, adequacy of existing facilities, progress in pollution abatement, requirements for waste treatment plants and the status of treatment works projects.

Part II deals essentially with sub-basin reports.

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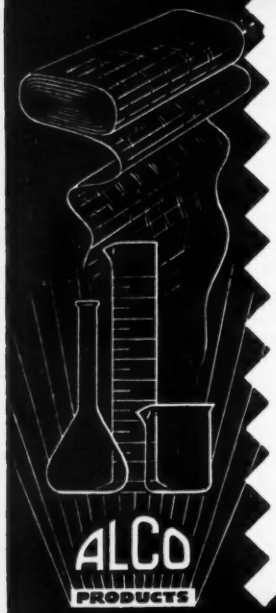

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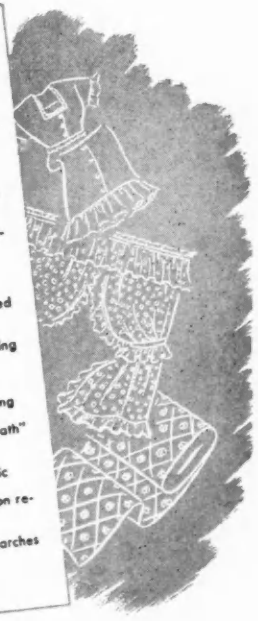

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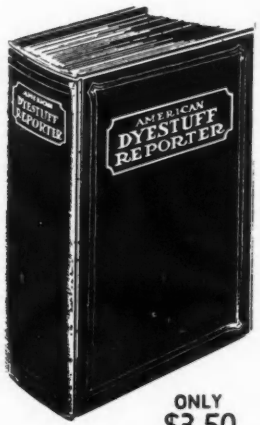

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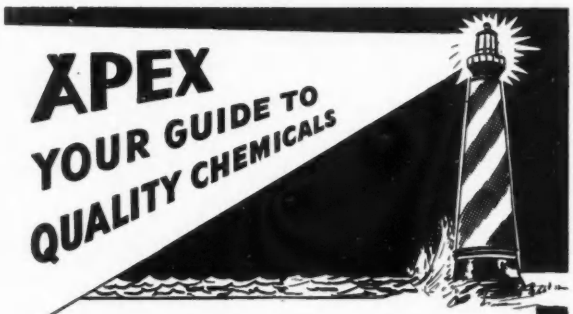

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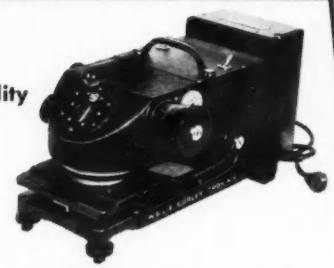

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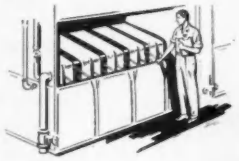

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June 11, 1951

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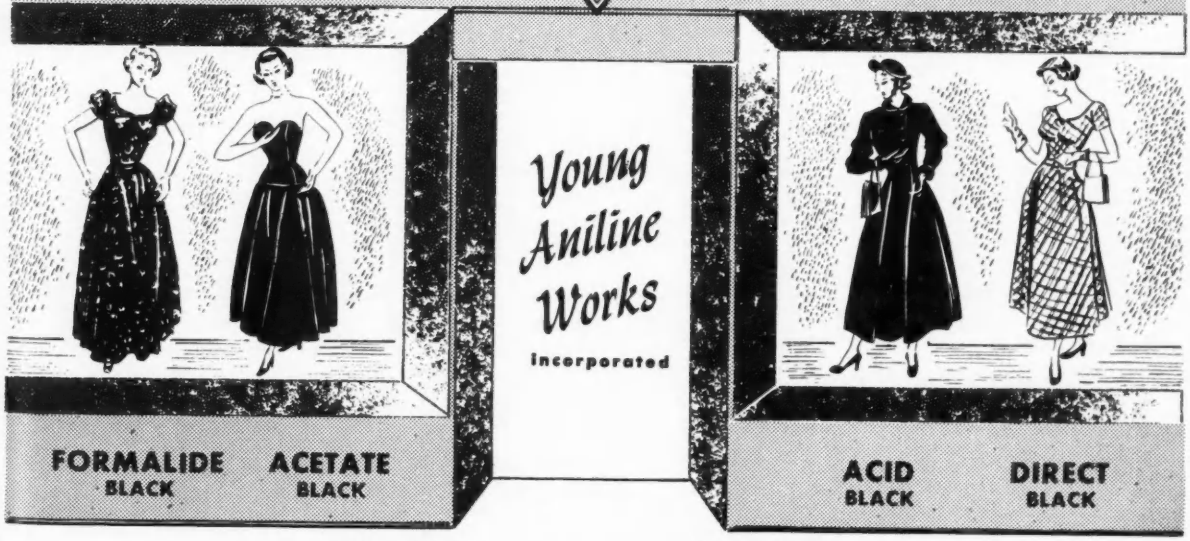

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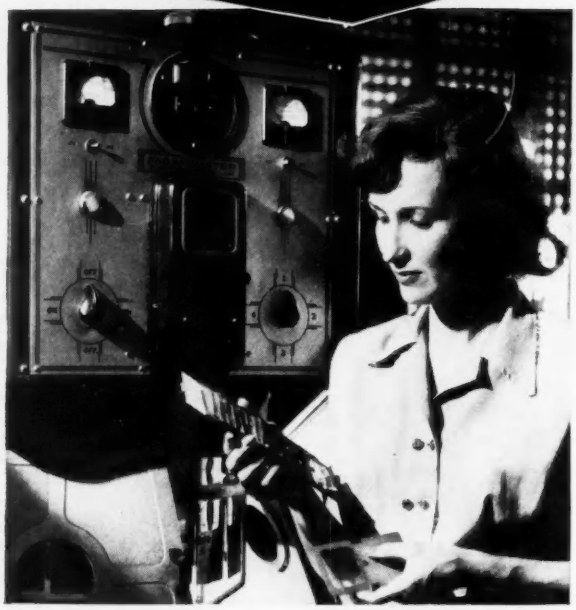

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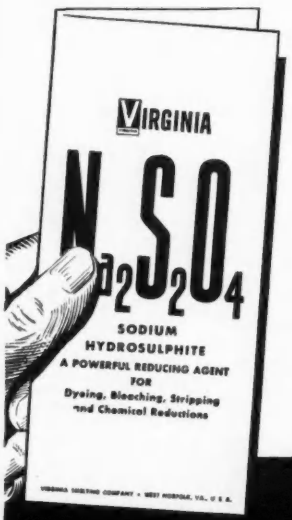

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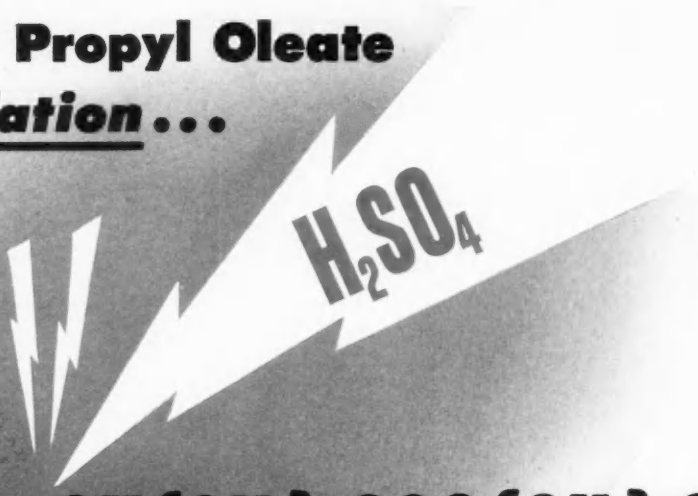

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